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MAKERS GUIDE



JOHN A. SEAVERNS

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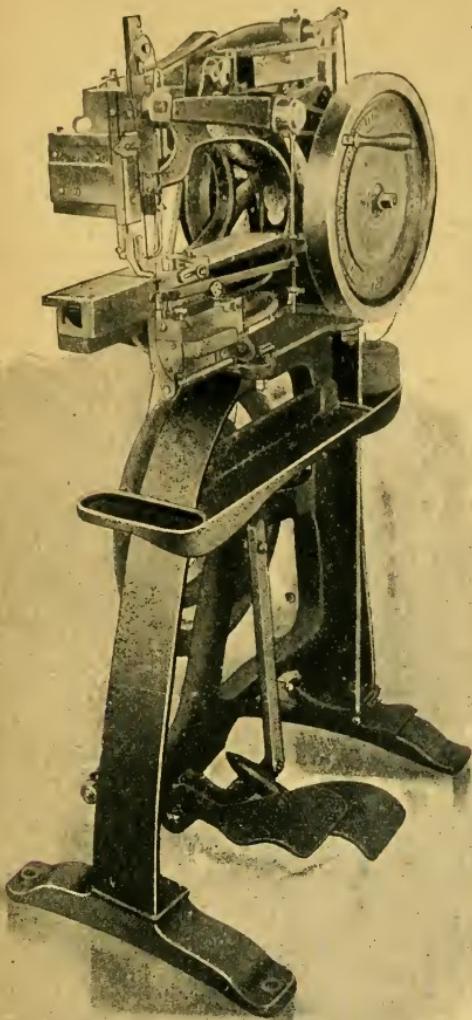


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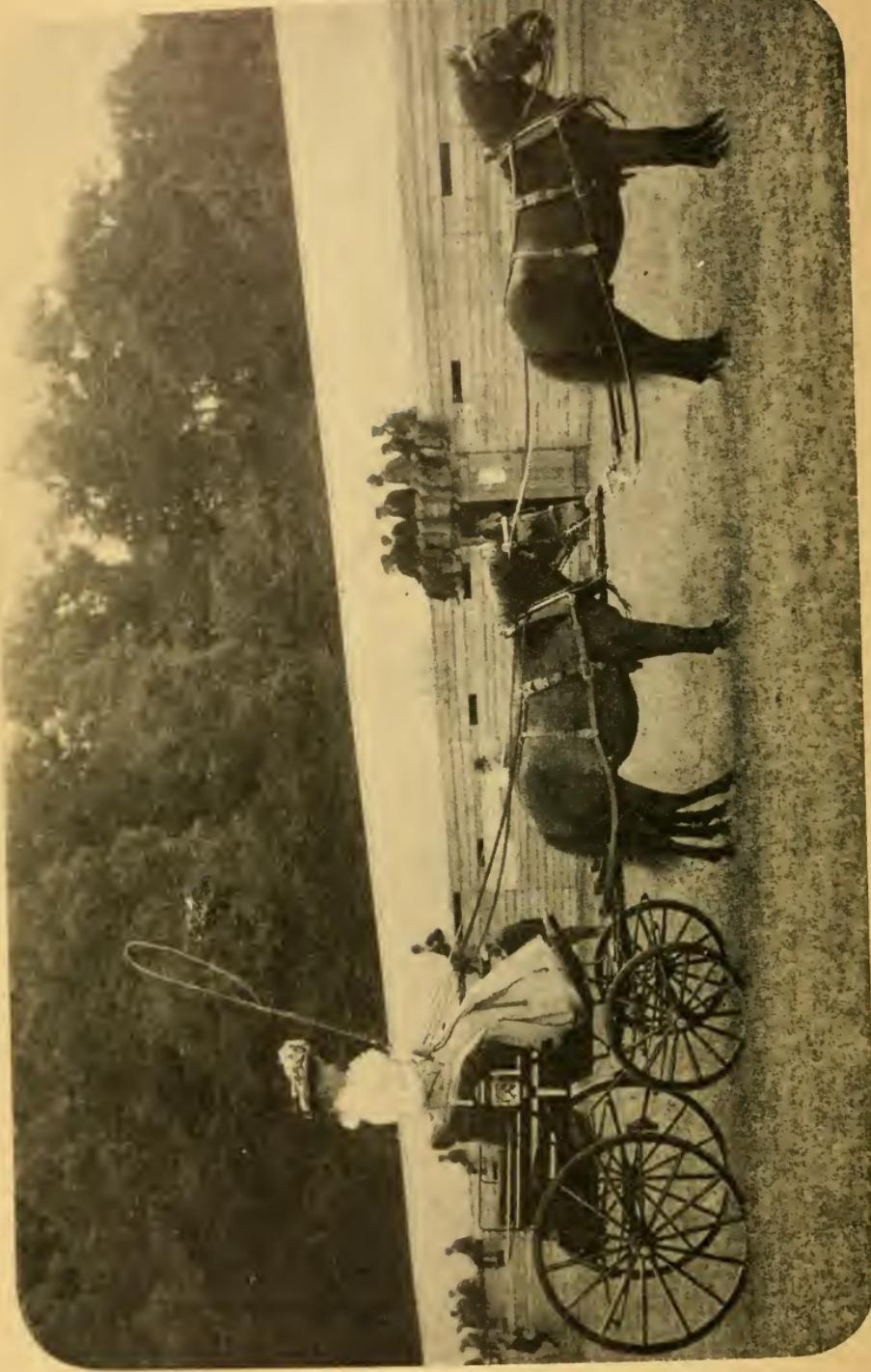
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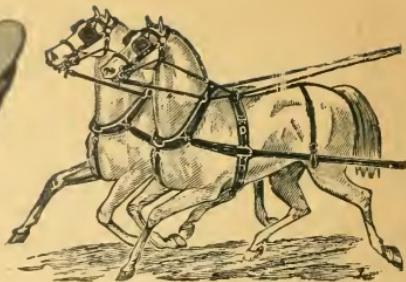
THE
HARNESS MAKERS' GUIDE
CONTAINING THE LENGTHS
FOR CUTTING AND MAKING HARNESS,
BRIDLE WORK, STRAPS, &c.,
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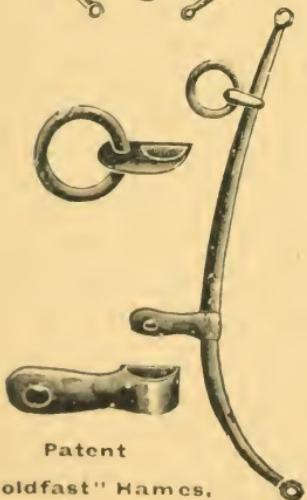
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This Index tells you which page to turn to when you wish to refer to the useful and valuable information contained in the "Harness Makers' Guide."

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P R E F A C E.

IN issuing the Second Edition of "THE HARNESS MAKERS' GUIDE," the publishers repeat the warning given in the preface to the First Edition, to the effect that the lengths and sizes given in this work are based on an average between those recognized by different makers. Hence it is necessary that cutters should exercise caution when fitting animals of abnormal proportions.

The information given has been thoroughly revised, and every endeavour has been made to increase the usefulness of the present edition by the inclusion of instructions for the manufacture of a large number of additional articles. The article upon "Choosing Leather" has been re-written, and the information imparted is the result of a life-long study of leather manufacture, and is from the pen of a practical currier of high repute. The scope of "THE HARNESS MAKERS' GUIDE" is increased by the inclusion of an instructive and practical article upon the art of "Engraving and Monogram Cutting." This is added for the benefit of those who have the time and desire to devote to this fascinating work.

In a work of this kind it would be absolutely impossible for no mistakes to occur; the publishers will, therefore, welcome intelligence of such, with a view to correction in future issues.

AN EXPLANATION.

The "Crown" Brand of our Black and Brown

Harness Leather is
and no time nor
the preparation; the
consideration, as our
a Harness Leather

OUR
THREE BRANDS.



a super selection,
labour is spared in
price is a secondary
object is to produce
second to none.

The "Sceptre" Brand in both Black and Brown
Harness Leather is the same oak-bark tannage, and
warranted unweighted and unadulterated. It is intended
to meet the re-
the large bulk  requirements of
Trade who are
honest and reliable Harness Leather. Consistent with a
sound, thoroughly well bated oak-bark tannage and pure
hand-stuffed, unweighted dressing, it is listed at the
lowest possible price.

The "Orb" Brand is an inferior selection,
and is offered to
for a lower grade
It is a reliable
able for export or
trade. Where com-
culty, it may be recommended with confidence.
meet the demand
article "at a price."
quality, and is suit-
the intermediate
petition is a diffi-



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THE HARNESS MAKERS' GUIDE.

CHOOSING LEATHER.

Harness in Great Britain is almost universally made from leather stained black on the grain, and this equally applies to Europe, Canada, and the United States; but in many tropical countries, more especially in South Africa and Australia, brown harness leather, natural colour, or stained a light London colour, or even a rich orange is in use.

It is difficult to account for this, unless it be that in hot, dry countries the dust would be more apparent on black leather—and brown boots are certainly more in demand there for this reason—or whether it is that the native product in a young country is brown for the sake of economy, and the prejudice becomes “rooted.” But in a chapter on “Choosing Leather,” it is of greater importance to decide the relative merits of each.

Now, it is natural that if a man wishes to buy brown leather he selects it of a bright, attractive, even colour throughout, but to produce leather of this description, practically no grease whatever can be used in the dressing, and as grease (the more the better) is the very life and vitality of leather that is exposed to weather and hard usage, it follows that brown leather dressed according to the accepted methods in vogue cannot possess the same durability as black leather, the colour of which is not affected by the amount of grease it is fed upon during the various currying processes. It is, however, only right to add that one London firm of old standing has broken free from the limitations of prejudice and solved the problem of how to produce a brown leather, bright, even, and attractive in colour, and yet with sufficient grease in it to lubricate the fibres and make it sufficiently waterproof to withstand the attacks of damp and weather.

Harness leather may be obtained direct from the currier, or from the saddlers’ ironmonger, in the form of backs (*i.e.*, with the bellies cut off) or hides. Both are cut down the backbone after leaving the tannery, as it is in this form a piece of leather is more easily dealt with, and the currier can set out the grain better. It is a question for the harness maker himself to decide whether to buy hides or backs, as it is entirely governed by the class of business which he does. If the bulk of his trade is jobbing work, more especially in country districts, there are many opportunities for profitably using the bellies, and as the price of hides is from 1½d.

to 2d. per lb. less than the equivalent weight in backs, it may be found more economical to buy in this form.

Where to buy is a matter of the first importance, as a harness maker's reputation for supplying a reliable article may easily be ruined, or at least seriously prejudiced, by using inferior and adulterated leather.

If he is in a small way of business and requires single sides at a time, he cannot do better than go to a well-reputed firm of saddlers' ironmongers and obtain his leather at the same house as his metal work and sundries, for they will doubtless give his orders greater personal attention. If, however, he is in a position to buy half-a-dozen pairs at a time (generally known as a bale) he will be well advised to open an account with some firm of harness curriers whose reputation for first-class and reliable quality has stood the test of years. In buying direct you may not only save the middleman's profit, but you have the satisfaction of coming into personal contact with the producer, who can not only offer practical advice in the event of complaint, but he is likely to be more amenable to persuasion and compromise should actual loss result.

It is of the utmost importance to buy well, and the harness maker, having found his market, must next concern himself with the quality of the leather he buys.

We all know the difference that a certain year's crop will make to the value of a vintage, but that difference is as nothing to the differences between the relative value of one tannage and another. It takes a very shrewd judge of leather to assess the quality of tannages, and faith in the ability of your currier's judgment is inevitable. Leather can now be tanned in as many days as it once took months, and it is a regrettable fact that many fine old tanneries that took from twelve to fifteen months to produce leather in the mildest of cold oak bark liquors, have of late years been either closed or been forced to radically alter their methods, in consequence of the inability of the harness maker to appreciate the quality of their old-time leather.

There still remains a wide difference between the astringent foreign extract tannages so largely used and a genuine English oak bark tannage worked on scientific principles. The finished article may appear similar, but the latter will stand the test of time, which the former will not. One will bring credit to the harness maker—who, having convinced himself that he is getting what he pays for, is willing to give a shilling or two more for his back—the other, through ignorance or parsimony, courts complaints and loss of accounts.

The dressing or currying of leather is a subject upon which every harness maker considers he is entitled to speak, and as regards the finished article he does so with considerable justification, for he handles the leather previous to its manufacture into harness, and his contract work gives him the opportunity of watching its wearing qualities. The harness maker, almost to a man, will ask for a "well filled" leather, and will often remark, "I don't like the dubbin spared."

On the other hand, the dealer or saddlers' ironmonger more frequently stocks a light fleshed leather, under the impression that it is not weighted. Now this is a fallacy, for whereas harness leather, weighted on the flesh side by drumming or brushing into it melted sugar or other heavy weighing saccharine matter, possesses a light, bright coloured flesh, while the leather well and thoroughly curried with best cod oil and tallow is not so firm as the dry, harsh, smart-looking weighted leather, but has a well-filled, fat, dark mahogany-coloured flesh. With this latter there may be a little more difficulty in keeping the wax on the thread, but this is of little importance as compared with the more waterproof nature of the leather, its freedom from any tendency to crack, its well lubricated fibre, increasing in a remarkable way the tensile strength of the leather and its consequent durability.

Touching on the subject of cracky leather, it may be mentioned that the most fruitful source of this complaint is the drumming in of melted sugar, glucose, or other crystalline weighting matter which penetrates the grain, and it follows that when this cools it forms minute crystals, fixing the fibre and making the surface brittle. There are, however, two other genuine causes for this trouble. When the raw hide arrives at the tannery, and before it goes to the liquors, it is passed through "limes" of varying strengths to part the hair from the pelt, and this makes the grain brittle and has to be counteracted by subsequent bating and scouring processes. If this is not scientifically and thoroughly done it will never produce a kind mellow grain, and that absence from crack that is so vital to the durability of the leather. If the stitches sink readily and easily into the grain, it may be taken as an indication of a well-bated and thoroughly scoured leather, and care should be exercised in sewing such leather not to pull through too hard. The third cause of leather cracking is too quickly drying (after setting or resetting) in a strong east wind. This requires care in the drying sheds, and the *louvre* or weather boards should be regulated accordingly.

Any unbiased article on the subject of "Choosing Leather" must necessarily draw attention to the almost universal use of artificial weighting materials in the production of harness leather, with the object of being able to sell at a low price. It may be taken as an axiom that all such weighting materials of a deleterious nature are soluble in water, and it therefore follows that if two pieces of leather, one weighted, the other not, are soaked in water and re-dried, the weighted piece will suffer greater loss in weight than the unweighted piece. For exact data, the pieces to be tested must be cut from the same part of the hide, and must be of the same substance and weight. It also follows that the leather that has lost most will be the least waterproof, for a sound bark tannage and scientifically blended greases are little affected by immersion in water. On the other hand, it is a fatal test for common extract tannages and artificial weighting materials of any kind, as both are soluble in water and soak out during the period of immersion.

Though the adulteration of harness leather is so universal, it is not always practicable for the harness maker to detect it with certainty, and it is a safe plan, when buying from your ironmonger

or currier, to insist upon having only such leather as is stamped and guaranteed "unadulterated." This will ensure freedom from glucose or other artificial weighting material, as prosecution could result if proved to be untrue. Some curriers sell harness leather with specified brands, and it is reasonable to suppose that when sold in this way the currier particularly aims at uniformity in tanning, dressing, and selection. If this can be relied upon it relieves the harness maker of much anxiety, for reliability and uniformity have been the secret of the success of many a good business.

In purchasing leather, see that it is free from warble holes, and is of a close, firm grain, without scratches or other imperfections, and well filled and level throughout. This is not always easy to obtain. Some hides will have a perfect grain, and be full and plump at the back, but fall away at the shoulders, and nothing makes more imperfect reins, backbands, or traces, than these.

A FEW HINTS ON CUTTING.

Harness leather should be of a close, firm, glossy grain, well grown, and of fairly even substance. In choosing it, see that the flanks and other extremities are light and clean, because any excess of weight or waste here, increases the cost of the prime parts.

Having selected a suitable side or back, examine it carefully for any defects. There are two methods of cutting. The first—and that which is more generally adopted—is to straight-edge the leather as shown by the dotted line in Fig. 2, and to cut straight away from this edge. Another plan (which is preferred by some cutters), is to cut 6 inches into the back, as shown by the full line in the same illustration, utilizing this off-cut for gig reins. The leather at this part is found to give greater satisfaction in wear than when the strips are taken close to the back line, where it is always less firm, and consequently not of the same tensile strength.

The part marked A in Fig. 2 will be found stouter than any other portion, and from B to the belly-edge it will be lighter than elsewhere. That marked C is seldom of any use when cut into strips. It is generally flabby, and well scored by the butcher, and proves of more value if cut off in the piece, when it comes in useful for side-piecing collars and such like repairs.

No rule can be laid down here as to the correct order in which the strips should be taken after straight-edging the hide or back. Not only would this necessitate dealing with every style of harness given here, but different qualities would also have to be dealt with, and the various conditions of manufacture. One man may have half-a-dozen pairs of backs to choose from, of different weights and substances, and he is thus able to cut out the various parts with a better regard to efficiency and economy than the man who has a single pair for the purpose.

Practice and careful judgment are the best tutors in gaining knowledge of this work.

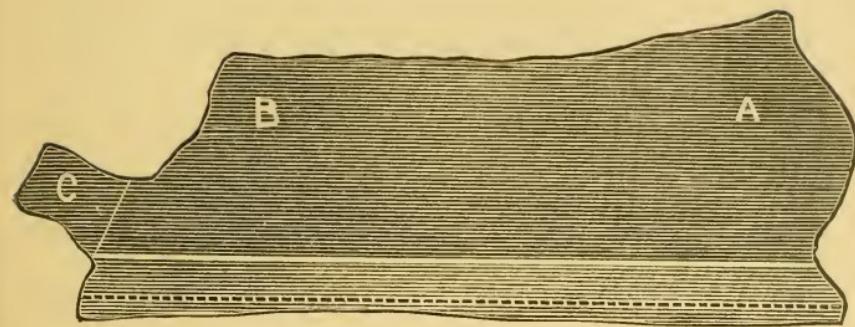


Fig. 1.—WHOLE HIDE.
A, Butt. B, Belly. C, Shoulder. D, Neck. E, F, Cheeks, Face.

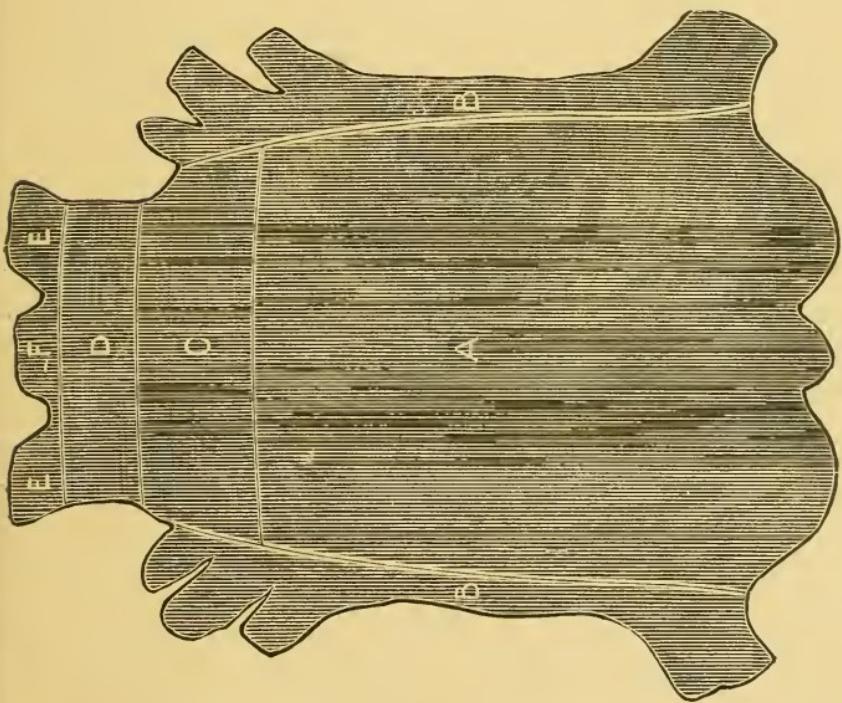


Fig. 2.—HARNESS PACK.
(See Hints on Cutting).

CART HARNESS—THILLER, No. 1.

BRIDLE.

Head	... ...	$1\frac{1}{2}$	by 22in.	Throat	... ...	$1\frac{1}{2}$	by 22in.
Cheeks, cut	... ...	$1\frac{1}{2}$	by 30in.	„	point	$1\frac{1}{2}$	by 9in.
„ made up	... ...	$1\frac{1}{2}$	by 13in.	Front, between	... ...	$1\frac{1}{2}$	by 15in.
Noseband, cut	... ...	$1\frac{1}{2}$	by 20in.	Winker Stay	... ...	$1\frac{1}{4}$	by 13in.
„ made up	... ...	$1\frac{1}{2}$	by 14in.	„ „	split...		8in.
Winkers, cut to pattern	... ...					$6\frac{3}{4}$	by $6\frac{1}{4}$ in.
Bearing Rein, off side	... ...					$1\frac{1}{2}$	by 60in.
„ near side	... ...					$1\frac{1}{2}$	by 24in.
If „ „ off side	... ...					$1\frac{1}{2}$	by 42in.
„ „ near side	... ...					$1\frac{1}{2}$	by 12in.
If with billets, cut these	... ...					$1\frac{1}{2}$	by 12in.
Leading Rein	... ...					1	by 60in.

COLLAR AND HAME STRAPS.

Collar Straps (2)	... ...	$1\frac{1}{2}$	by 16in.
Top Hame Strap	... ...	1	by 28in.
Collar Housing (square)	... ...	9	by 22in.
Housing Straps (2)	... ...	1	by 12in.

Round Collar Housing cut to pattern.

BREAST COLLAR.

Body, cut	... ...	4	by 44in.
Lay, made up	... ...	3	by 36in.
Wither strap	... ...	$2\frac{1}{4}$	by 38in.
„ „ split	... ...	1	by 12in.
„ „ tugs (4)	... ...	1	by 6in.
„ „ „ placed from chains			$4\frac{1}{2}$ in.

Ordinary Breeching Irons are used for the draft chains.

If Contract Irons, make back tugs proportionately shorter.
 When required for Plough or Fore Gears, hooks must be used
 instead of chains.

SADDLE.

Top, cut in two pieces, about	... ...	8	by 24in.
Girths, if nailed to tree	... ...	$1\frac{1}{2}$	by 60in.
Girth Points, if nailed to tree	... ...	$1\frac{1}{2}$	by 24in.
Girths, if sewn into rings	... ...	$1\frac{1}{2}$	by 56in.
Girth Points, if sewn into rings	... ...	$1\frac{1}{2}$	by 22in.
Meter Buckle Pieces (2)	... ...	$1\frac{1}{2}$	by 9in.

CRUPPER.

If made to buckle to loop on saddle tree.

Body	... ...	$3\frac{1}{2}$	by 24in	Hip Straps (2)	... ...	$1\frac{1}{2}$	by 26in
Lay	... ...	2	by 20in.	Loin Strap	... ...	$1\frac{1}{2}$	by 48in
Billet	... ...	2	by 26in	Loin Strap Tugs	... ...	$1\frac{1}{2}$	by 51in
				Distance between dee and buckle,	10in.		
				If made to buckle to strap nailed on tree.			
				Crupper Strap, 2 by 18in.			Other particulars as above.

Cart Harness—Thiller, No. 1 (*continua*).**BREECHING.**

Body, cut 3½ by 72in.	| Lay, made up ... 2½ by 58in.
„, made up ... 3½ by 60in.	Hip Strap Tugs ... 1½ by 7in.
Lay, cut 2½ by 70in.	If with dees 1½ by 5in
Hip Strap Tugs fixed 14 inches from each end.	

No. 2.**BRIDLE.**

Head 1½ by 24in.	| Throat, cut ... 1¼ by 20in.
Noseband, cut ... 1½ by 20in.	„, made up ... 1¼ by 15in.
„, made up 1½ by 14in.	„, point, cut ... 1¼ by 12½in.
Winker Stay ... 1½ by 14in.	„, „, made up 1¼ by 10in.
„, „, split 8½in.	Front cut 25in., made 15in. within

Winkers cut to pattern—(winker and cheek combined).

Winker part about 7½in. square; extended cheek 2½in. wide.
Total length 15in.

The winker scolloped or cut D pattern before blocked and sewn.
Cheeks and nose cut for turning through rings as indicated on
patterns for Scotch Cart Harness.

Chape to secure cheek buckles. 1¼in. dee attached by link to the
buckles, into which throat and point are sewn.

Small 1in. bucklepiece slides on head to receive winker-strap.

Collar Straps 1½ by 17in.
Hame Straps 1¼ by 24 to 28in.

SADDLE.

(Made on 13in. Lincoln Tree).

Top cut in two pieces, about 6½ by 21in.

Side leathers cut about 6in. by 10in., and shaped.

The front pattern of top shaped so that the centre is raised when
nailed on the tree.

Sidestrings (or Hangers) 1¾ by 16½in.
Girth (when made up on above) ... 1¾ by 50 to 54in.
Girth point „ „ „ 1¾ by 24in.
Crupper Strap 2 by 16in.

An illustration of this style of saddle, with full particulars for
making same, appeared in "SADDLERY AND HARNESS"
for April, 1901.

BREECHING AND CRUPPER.

Body, cut 3½in. wide. | Lay, cut 2¾in. wide.
The full length of hide or back.

Body made up, 60in.

The two strips are reversed—the light or neck ends being turned
beyond where the body is punched for the hip-strap tugs.

Hip-strap tugs, about 12in. from each end.
„ „ cut 1½ by 17in.

Cart Harness—Thiller, No. 2 (*continued*).

Hip-strap tugs strongly sewn together at the back, underneath the shaped safes.

Loin-strap tugs, cut $1\frac{1}{2}$ in. by 10in.

" " joined, etc., at back as hip-strap ditto.

" cut ... $1\frac{1}{2}$ by $50\frac{1}{2}$ in.; made up 46in.

Hip-straps (2) ... $1\frac{1}{2}$ by $30\frac{1}{2}$ in.; " 26in.

Crupper body $3\frac{1}{2}$ by 24in.

" lay $2\frac{1}{2}$ by 26in.

" " reduced in front to $2\frac{1}{2}$ in. for buckle.

Distance between dee and opening for loin-strap about 9in.

BILLETED WANTEY, or BELLYBAND.

Body, made up 3 by 36in. Billets (2) 3 by 28in.

TIE WANTEY.

Body, cut 3in. by full length of hide.

Lay, cut $2\frac{1}{2}$ in. " " "

Tie Piece ... $2\frac{1}{2}$ in. to make total length 13 feet.

Made up full width the first 3 feet, then gradually reduced to a point

Cart Bellyband with chain-ends, made up 3in. or $3\frac{1}{2}$ in. by 36in.

Either stout single leather, or double and sewn 4 rows.

CART HARNESS—LEADER.**BRIDLE.**

Leading Rein, 1 by 102in. Other particulars same as Thiller.

Collar and Hame Straps as Thiller.

BACKBAND.

Body, cut 4 by 40in.	|	Made up 4 by 32in.
Safes cut to pattern.		

Bellyband $1\frac{3}{4}$ by 38in.	|	Bellyband Strap ... $1\frac{3}{4}$ by 17in.
-------------------------------------------	--	---------------------------------------------

O: with rings and hook-ends, $2\frac{1}{4}$ by 36in.	single, or double,
and sewn 3 rows.	

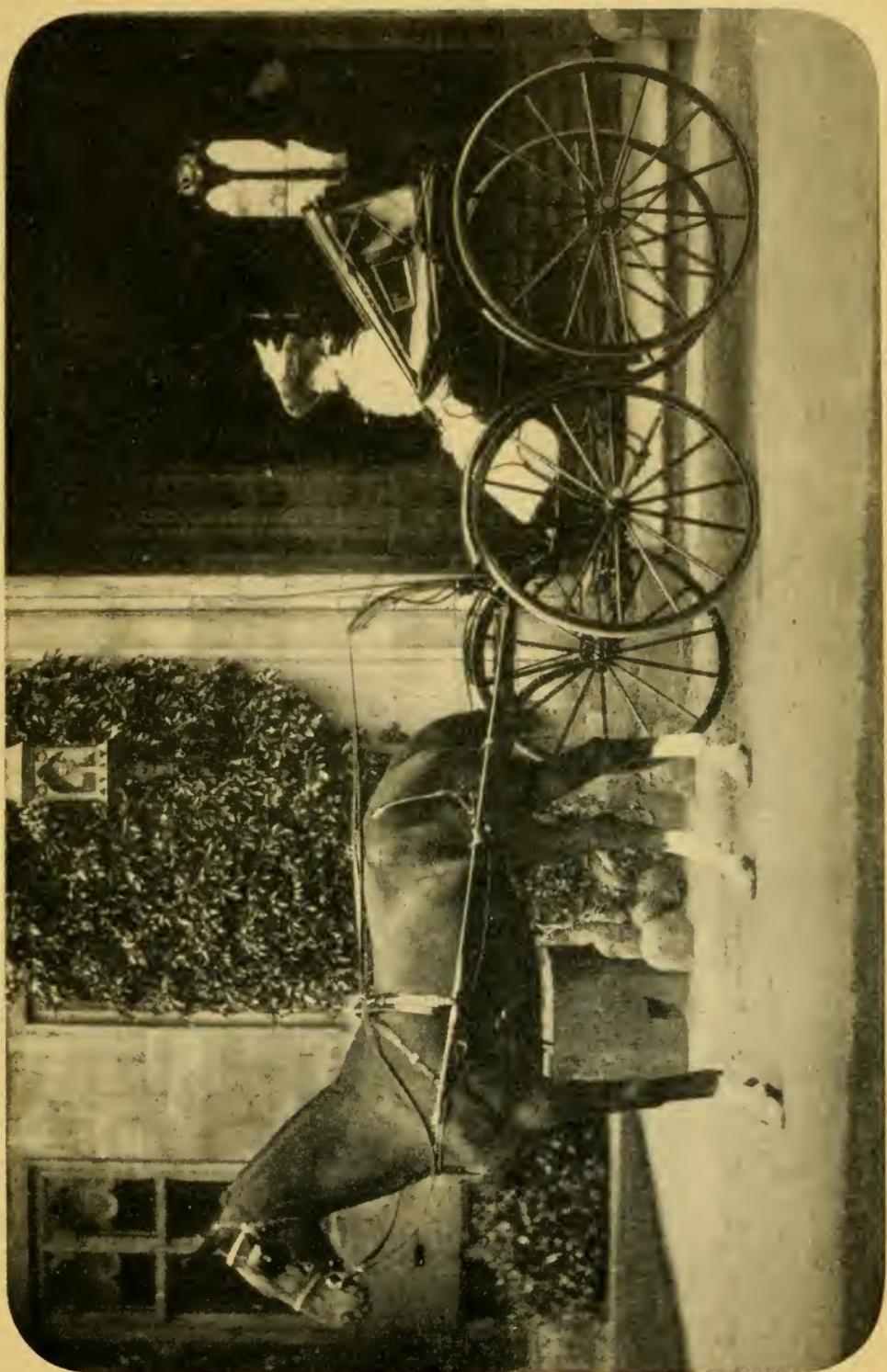
CRUPPER.

If to buckle to Collar Straps.

Body $3\frac{1}{2}$ by 48 or 50in.	|	Dock, cut $3\frac{1}{2}$ by 18in.
Body, split at point	12in.	Hip Straps, made up $1\frac{1}{2}$ by 26in.
Body, split at back	12in.	Hip Strap Tugs, $1\frac{1}{2}$ by 5in.

Hip Strap dee sewn on to Crupper body 12in. from end.

If made without dock, cut body 40in. long.



Cart Harness—Leader (*continued*).**CRUPPER.**

If to buckle to Collar.

Body	$3\frac{1}{2}$ by 46in.	Billet	2 by 24in.
Split at back end only		8in.	

LONDON STYLE CART HARNESS—THILLER.**BRIDLE.**

Head	$1\frac{1}{4}$ by 24in.	Cheeks, cut	$1\frac{1}{4}$ by 28in.
Winkers, cut	$6\frac{3}{4}$ by $6\frac{1}{4}$ in.	Cheeks, made up ...	$1\frac{1}{4}$ by 13in.
Brace Piece (see Fig. 3), Combined Winker and Brace Piece (see Fig. 4.)			
Figs. 1 Noseband, cut to pattern.		Front, within ...	$1\frac{1}{4}$ by 14in.
1 & 2 Noseband, made up ...	15in.	Front, Throat, and Point,	
Check Rein	$1\frac{1}{4}$ by 78in.	cut in one piece ...	$1\frac{1}{4}$ by 48in.
Throat	$1\frac{1}{4}$ by 22in.	Rein, off side ...	$1\frac{1}{4}$ by 60in.
Throat, point ...	$1\frac{1}{4}$ by 9in.	Rein, near side ...	$1\frac{1}{4}$ by 26in.
Rein holders from dees in cheeks ... $\frac{3}{4}$ by 24in.			

REIN RUNNERS (For supporting Check Rein).

Neck Runner	$1\frac{1}{4}$ by 22in.	Wither Runner ...	$1\frac{1}{2}$ by 18in.
Rib Runner	$1\frac{1}{2}$ by 12in.	Billet in each case	$\frac{3}{4}$ by 9in.

COLLAR.

Housing, cut to pattern (see Fig. 5).

Meter Straps	$1\frac{1}{4}$ by 17in.
Hame Strap	1 by 27in.

SADDLE.

Fig. 6 { Housing for 12in. tree	18 by 24in.
,, , 11in. tree	17 by 23in.
,, , 10in. tree	16 by 22in.
Girth	$1\frac{1}{2}$ by 60in.
Girth Strap	$1\frac{1}{2}$ by 24in.
Meter Buckle Pieces	$1\frac{1}{4}$ by 9in.

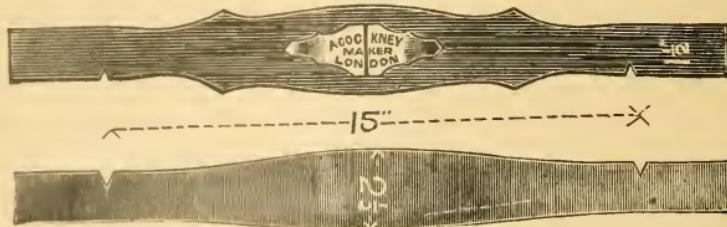
CRUPPER.

Hanging dee in place of a dock.

Body	$3\frac{1}{2}$ by 20in.	Hip Straps	$1\frac{1}{4}$ by 27in.
Lay	$2\frac{1}{2}$ by 20in.	Loin Strap	$1\frac{1}{4}$ by 48in.
Billet	$2\frac{1}{2}$ by 27in.	Turn back of lay over second dee	
First dee from buckle	10in.	forms "butt" against which hip	
Second dee from buckle	13in.	strap dee rests.	

BREECHING.

Body, made up ...	3 by 72in.	Loin Strap Tugs ...	$1\frac{1}{4}$ by 5in.
Lay	$2\frac{1}{2}$ by 70in.	Hip Strap Tugs ...	$1\frac{1}{4}$ by 7in.
Hip Strap Tugs from each end 16in.			
Tug Safes cut to pattern (see Fig. 7).			



Figs. 1 & 2.—Swelled Nosepieces for Name-plate.

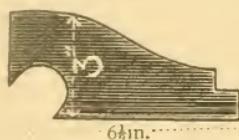


Fig. 3.—Brace-piece for Cheek.

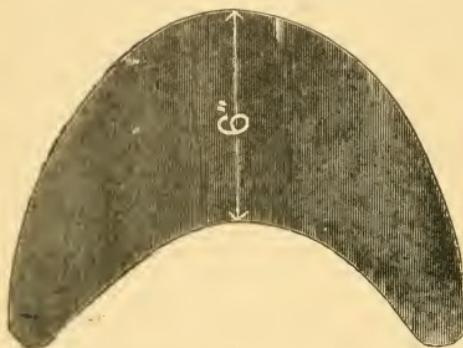


Fig. 5.—Round Housing for Collar.

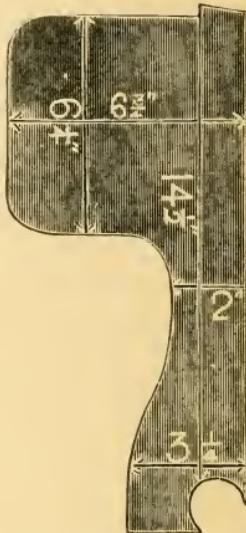


Fig. 4.—Combined Winker and Brace-piece, shewing Cheek-line.

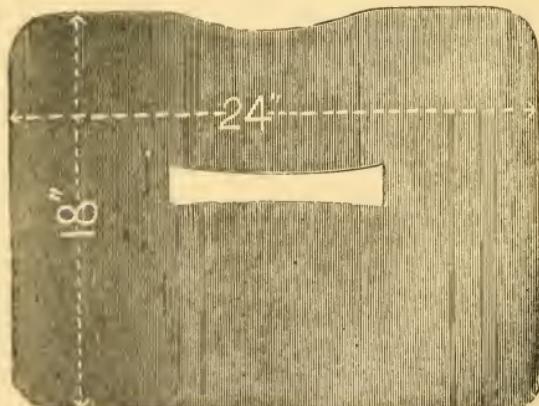
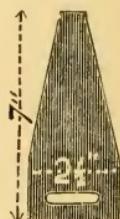


Fig. 6.—Square Housing for Saddle.



PATTERN FOR LONDON-STYLE CART HARNESS—THILLER.

SCOTCH CART HARNESS—THILLER.**BRIDLE.**

Head, cut (see Fig. 1) ...	... 3½	by 25in.
Head split, 6½in. each side, with piece cut out of centre to reduce the points to 1¼in.; Crown part reduced also (see Fig. 1).		
Noseband, cut ...	... 3½	by 22in.
,, made up to pattern (see Fig. 3) ...		14in.
Cheeks and Winkers combined, cut to pattern (see Fig. 2).		
Front, between ...		13in.
Throat Band	1¼	by 21in.
Winker Stay, cut ...	1½	by 13in.
,, split ...		8in.
Rein, off side ...	1¼	by 54in.
,, near side ...	1¼	by 24in.
If with watering chain, off side ...	1¼	by 42in.
,, near side ...	1¼	by 12in.
Coupling Straps for Cheek and Rein Rings ...	¾	by 7in.

COLLAR (Peaked Top, Side Pieces to pattern).**COLLAR AND HAME STRAPS.**

Collar Straps (2) 1¼ by 16in. ... Top Hame Strap only, 1 by 26in.

SADDLE.

Tops cut to pattern (see Fig. 4).

Seam Covers to pattern (see Fig. 5 and 6).

Loose Girth, buckle each end ...	2½	by 46in.
Girth Straps, drawn into ring on each side ...	1½	by 16in.

Rope Bellyband.

CRUPPER (see Fig. 8).

Hip Straps (2) sewn into ring ... 1½ by 26in.

Loin Straps, pointed both ends ... 1½ by 48in.

Fore bearers (2) sewn into ring, with chain at other end to fix to hook at back of saddle trough, made up ... 1½ by 18in.

Ring Safe, cut to pattern of a circle, 5½in. in diameter.

BREECHING.

Body, cut ... 3½ by 78in. ... Made up ... 3½ by 68in.

Lay, cut ... 2½ by 78in. ... Made up ... 2½ by 68in.

Loin Strap Tugs, sewn on chains ... 1½ by 5in. With Safes cut to

Hip Strap Tugs, sewn in seat ... 1½ by 7in. ; pattern (see Fig. 7).

SCOTCH CART HARNESS—LEADER.**BRIDLE.**

Leading Rein ... 1 by 66in

Other particulars as Thiller.

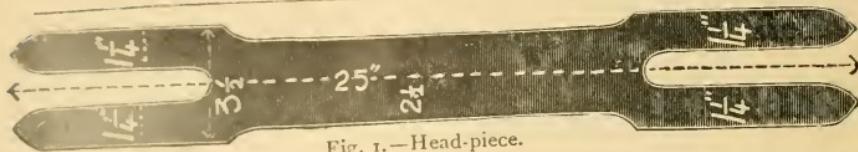


Fig. 1.—Head-piece.



Fig. 8.—Crupper.



Fig. 5.—Front-seam Lay-piece.

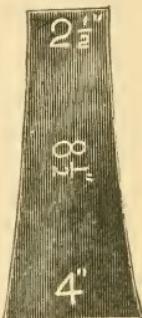


Fig. 6.—Back-seam Lay-piece.

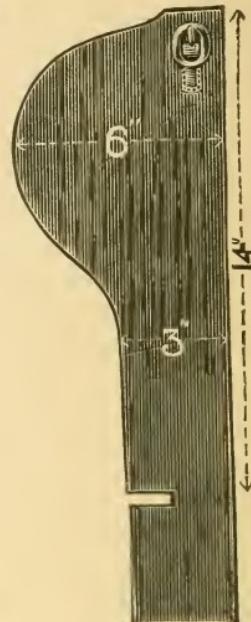


Fig. 2.—Cheek and Winker combined.

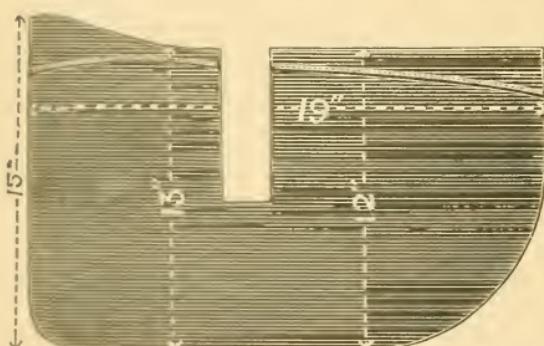


Fig. 4.—Saddle-top Cover.

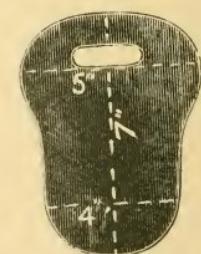


Fig. 7.—Breeching Tug Safe.

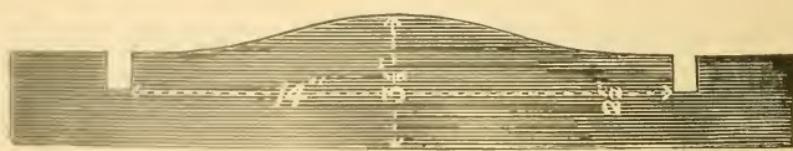


Fig. 3.—Noseband.

PATTERNS FOR SCOTCH CART HARNESS—THILLER.

Scotch Cart Harness—Leader (*continued*).**CRUPPER.**

Hip Straps (2) sewn on to ring	$1\frac{1}{2}$	by	24in.
Hip Strap Tugs (2) with safes	$1\frac{1}{2}$	by	5in.
Fore Bearers (2) sewn on to ring and going forward to tugs on chain traces at draft	$1\frac{1}{2}$	by	42in.
Fore Bearer Tugs (2) with safes	$1\frac{1}{2}$	by	5in.

Hip Straps and Fore Bearers are frequently cut $1\frac{3}{4}$ in. wide for Thiller as well as for Leader, in which case the Tugs are also cut $1\frac{3}{4}$ in. wide.

CART HORSE HEADSTALL.

Head, made up	$1\frac{1}{2}$	by	48in.
Nose, "	$1\frac{1}{2}$	by	36in.
Brace pieces	$1\frac{1}{2}$	by	13in.
,, ,, between on head ...			18in.
,, ,, nose ...			14in.
Throat (sewn on to head) ... 1	by	18in.	
,, point (sewn on to head) ... 1	by	9in.	

Ends of brace pieces and throat cut mitre shape.

In some districts the strapping is cut $1\frac{3}{4}$ in. or 2in. wide, and some are made without the throatband.

CART HORSE HEAD-COLLARS.

Head, cut	$1\frac{1}{2}$	by	28in.
,, made up	$1\frac{1}{2}$	by	24in.
Nose, cut	$1\frac{1}{2}$	by	23in.
,, made up	$1\frac{1}{2}$	by	$16\frac{1}{2}$ in.
Front (if used), cut	$1\frac{1}{8}$	by	25in.
,, ,, made up ... (within)	$1\frac{1}{8}$	by	15in.
Throat, cut	1	by	18in.
,, (with 1in. buckle), made up	1	by	14in.
,, point, cut	1	by	10in.
,, ,, made up	1	by	8in.
Cheeks, cut	$1\frac{1}{2}$	by	20in.
,, made up	$1\frac{1}{2}$	by	$8\frac{1}{2}$ in.
Back Stay, cut	$1\frac{1}{4}$	by	15in.
,, ,, made up	$1\frac{1}{4}$	by	6in.
Braces, cut	$1\frac{1}{2}$	by	$15\frac{1}{2}$ in.
,, made up	$1\frac{1}{2}$	by	6in.
Bucklepiece, cut	$1\frac{1}{2}$	by	$7\frac{1}{2}$ in.
,, made up	$1\frac{1}{2}$	by	3in.

NECK (sometimes called Stable or Manger) COLLARS.

Made up about 44in. long.

Cut $1\frac{3}{4}$ in., 2in., or $2\frac{1}{4}$ in. wide, as required.

In some localities swivels are used for attaching chain; in others strong dees are regularly used. These are put in about 6in. from the buckle end.

PIT HARNESS.

FULL SIZE.

HOODED BRIDLE.

Fig. 1 showing bridle with skull cap and hood complete; near side of hood the sight hole is closed, on the off side it is shown open.

Fig. 2: Hood Pattern—Lengths, A to B $12\frac{1}{2}$ in., C to D $22\frac{1}{2}$ in., E to F $13\frac{3}{4}$ in., G to H 19in., I to J $16\frac{3}{4}$ in., C to G, and D to H 5in., I to C, and J to D $4\frac{3}{4}$ in., V cut $1\frac{3}{4}$ in. by 1in., C to K $6\frac{3}{4}$ in., L to G $1\frac{3}{4}$ in. In fixing bring C to G and D to H, the wrap over cut off, if not a closed sight.

Fig. 3: Skull Cap Pattern—Lengths, A to B $10\frac{3}{4}$ in., C to D $7\frac{3}{4}$ in., E to F $3\frac{1}{4}$ in., head strap slip cut $2\frac{1}{2}$ in. (lay a piece of leather under this), A to G $7\frac{1}{2}$ in. for pad; let the basil leather lie flat and stuff lightly.

BRIDLE.

Headstrap	...	...	...	...	$1\frac{1}{2}$	by	20in.
Front, cut	...	...	...	...	$1\frac{1}{2}$	by	17in.
Front, within	...	...	...	...			$15\frac{1}{2}$ in.
Nose, cut	...	...	...	...	$1\frac{1}{2}$	by	17in.
Nose, within	...	...	...	...			14in.
Throatband, cut	...	...	...	$1\frac{1}{2}$	by	22in.	
'', made up	...						18in.
'', strap	...	...	...	$1\frac{1}{2}$	by	10in.	
Chin Strap	...	...	...	...	$\frac{3}{4}$	by	10in.
Buckle piece, cut	...	...	...	...	$\frac{3}{4}$	by	$11\frac{1}{2}$ in.
'', made up	...						10in.
Lead Rein	...	...	...	...	1	by	12in

COLLAR.

Size	...	...	...	...	...	22in.
Fore wale, cut	...	...	...	...	7	by 56in.

Side pieces to fit.

Cloth or Check, 32 in. by 12 in.	Throat piece, $5\frac{1}{2}$ in.
Closing Strap, $1\frac{1}{4}$ in. by 12 in.	Buckle piece, $1\frac{1}{4}$ in. by 12 in.
Hame Chafer, $2\frac{1}{2}$ in. by 7 in.	Long Straps, $1\frac{3}{4}$ in. by 21 in.

SADDLE.

$8\frac{3}{4}$ in. by 32 in., three thicknesses to pattern.

Cross Bars, cut 13 in. by $1\frac{3}{4}$ in.

Space under cross bars, $3\frac{1}{2}$ in. for a $2\frac{1}{4}$ in. backband.

Crupper Strap, cut, 2in. by 18in.; made up, doubled.

Linings, check, 15in. by 28in., sewn to $8\frac{1}{2}$ in. from centre.

Chined $2\frac{1}{2}$ in. wide.

Space under cross bars for $2\frac{1}{4}$ in. backband, $3\frac{1}{2}$ in.

Girth, made up ... $1\frac{1}{2}$ by 36in. } with squares and chapes.
Girth Strap, made up $1\frac{1}{2}$ by 20in. }

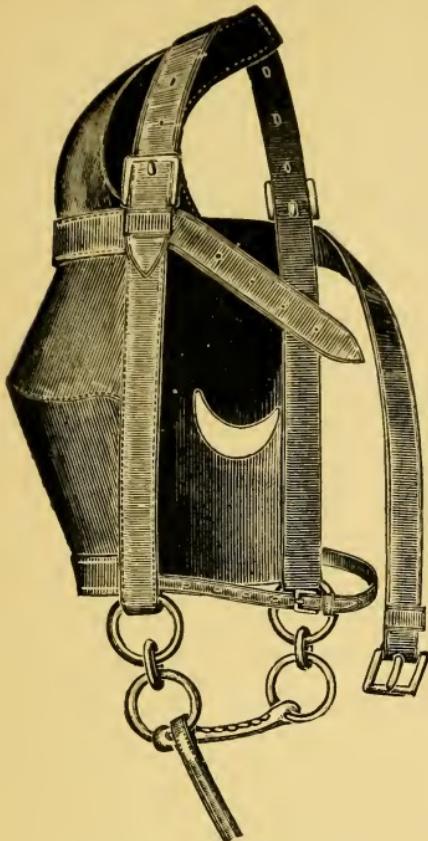


Fig. 1.—Pit Bridle (complete).

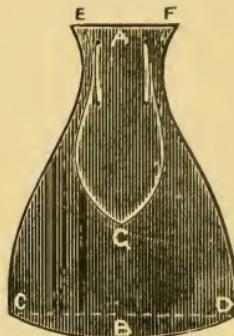


Fig. 3.—Skull Cap.

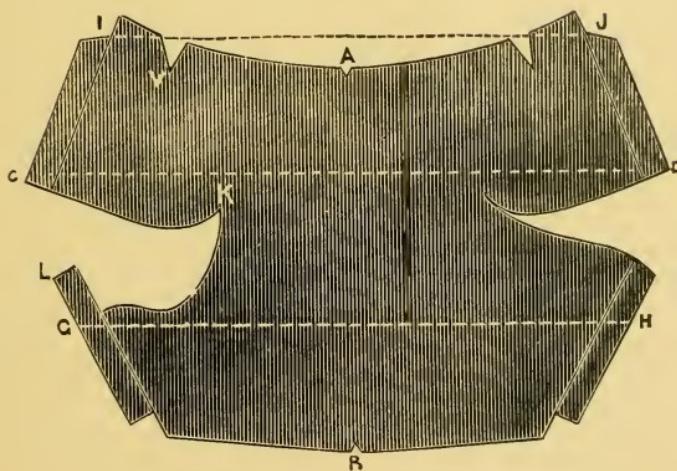


Fig. 2.—Hood Pattern.
PATTERNS FOR PIT HARNESS.

Pit Harness (*continued*).

BACKBANDS AND BELLYBANDS.

Cut $2\frac{1}{4}$ in. wide; length from 18in. to 22in., trace ends in addition.

CRUPPER.

Body	... ... ...	$3\frac{1}{2}$	by	19in.
Lay, made up	... ... ...	$2\frac{1}{4}$	by	15in.
Hip Straps, made up	... ...	$1\frac{3}{4}$	by	26in.
	(Lined throughout).			
Dock Loop	... ... ...	$\frac{3}{4}$	by	10in.
Pad	... ... ...			17in.
Lining for pad	... ... ...	$6\frac{1}{2}$	by	20in.

Basil or white leather bindings to pad.

BREECHING.

Body, made up	... ... ...	$3\frac{1}{2}$	by	56in.
Lay	... ... ...	$2\frac{1}{2}$	by	54in.

Muller rings and short tugs $1\frac{3}{4}$ in., set in, with the filling cut with small half circle extension 12in. from end for ring chapes.

Loin Strap, cut	... ... ...	$1\frac{1}{2}$	by	48in.
" , , tug	... ... ...	$1\frac{1}{2}$	by	5in.

Rope Reins, 24ft. Billets for ditto, 1in. wide

No loops except in Bridle and Loin Strap Tug.

Limmer Tugs, $1\frac{3}{4}$ in., double thickness throughout.

Chains for ditto, swivel with about 6 links and hook.

Very loose narrow loop.

MOWING MACHINE HARNESS.

In addition to ordinary Plough Harness:—

Pole Straps (double leather) 2 by 36in.

These should be very strong owing to the danger of injury to horses when they break, and the close proximity of the machine knives. If with light breechings, make same style as Pole Harness.

Seat	... ... ...	$1\frac{3}{4}$	by	70in.
Hipstraps	... ... ...	$1\frac{1}{4}$	by	28in.
Loin Strap	... ... ...	$1\frac{1}{4}$	by	48in.
Tugs (4)	... ... ...	$1\frac{1}{4}$	by	5in.
Breeching Straps	... ...	$1\frac{1}{2}$	by	42in.



PLOUGH HARNESS.

Bridles, etc., as ordinary Cart Harness.

Backband, with pipes	...	...	4	by	54in
,,	pipes cut	...	5	by	18in.
,,	with chains	...	4	by	40in.

Backband Safes to pattern

Other parts as ordinary cart harness

Backband, with pipes, made up	...	...	3	by	54in.
,,	pipes, cut	...	5	by	16in.
,,	with chains, made up	...	3	by	40in.
,,	(off side), if to buckle, made up	...	3	by	48in.
,,	(near side), if to buckle, made up	3	by	12in.	

Backband safes to pattern.

Crappers, cut	...	...	3	by	48in.
,,	split front end	...	...		12in.
,,	split back end	...	...		9in.
,,	rein runner on dee	...	3/4	by	16in.

Crappers, no hipstraps and tugs.

LEATHER BACKBAND.

Made up $3\frac{1}{2}$ in. or 4in. by 39in.

Safes or flaps cut about 9in. deep, 6in. wide at bottom for about 4in., the upper part being gradually reduced to width of backband.

These are fitted with hooks at each end. Sometimes the flaps are left plain; in other cases they are lined with leather or check and padded, to keep the chains from chafing the horse.

When webs are used for the centres they are cut from 36in. to 38in., the hooks and flaps being attached by ends or chapes cut about 9in. or 10in. long, and generally made half-circle pattern at the top.

One or two rein dees are placed on at different distances from the ends, according to the districts in which they are used.

ANOTHER STYLE OF PLOUGH BACKBAND.

Leather Backband cut $3\frac{1}{2}$ in. by 60in.

Turn back 6in. from each end and punch holes as for buckles in bend. Secure eye-ends of chains with pin inside the bends.

Safes, 10in. long by $3\frac{1}{2}$ in. at top, and $5\frac{1}{2}$ in. at bottom.

Sew on one dee 12in. from one end, and another 24in.—i.e., on top of backband.

Other kinds are made with narrower hooks, pad for top of backband, and to regulate by one or two buckles.

BULLOCK HARNESS, FOR DRAUGHT.

BRIDLES.

The various parts made as for Cart Bridles.

Cheeks, made up	... ... ... ...	1½	by	12½in.
Head, made up	... ... ... ...	1½	by	24in.
Front, between	... ... ... ...	1½	by	24in.
Throat, ...	... ... ... ...	1½	by	15in.
Point	... ... ... ...	1½	by	10in.
Cut in one piece	... ... ... ...	1½	by	52in.
Chin Strap, made as hame strap	... ... ... ...	7/8	by	18in.

1½in. rings in Cheeks and Chin Straps.

BACKBANDS.

Made as body rollers	... ... ... ...	4	by	78in.
Padded centre	... ... ... ...			18in.
Near side from pad centre	... ... ... ...			24in.
" " point straps	... ...	1½	by	18in.
" Pads, with 1¾in. dees sewn on for reins.				
Pads, with 1½in. rings for crupper straps				

CRUPPER.

Body	... ... ... ...	2	by	24in.
„ split	... ... ... ...			8in.
„ lay	... ... ... ...	1¼	by	15in.
Strap	... ... ... ...	1¼	by	48in.
Crupper folded dock to buckle.				

REINS.

Made up (each side)	... ... ... ...	1	by	168in.
Lined parts	... ... ... ...			20in.
Couplings	... ... ... ...	1	by	84in.
Pole Straps	... ... ... ...	1½	by	24in.
Traces (with cock-eye ends)	... ... ... ...	1½	by	78in.
Hame Tugs	... ... ... ...	1½	by	9in.
Meter Strap to slide on hame strap, and buckle to front of pad	... ... ... ...	¾	by	28in.
Hip Straps (double leather)	... ... ... ...	1¼	by	60in.
„ „ trace bearers (4), made up	... ... ... ...	1¼	by	7in.

FIRE ENGINE HARNESS.

BRIDLE.

Heads, cut	... ... ... ...	1¾	by	23in.
„ split	... ... ... ...	7/8	by	7in.
Cheeks, made up	... ... ... ...	7/8	by	8in.
Fronts, within	... ... ... ...			13in.
Throatbands, cut	... ... ... ...	7/8	by	26in.
„ „ made up	... ... ... ...	7/8	by	19in.
Nosebands (centres only) made up	... ...	1¼	by	14in.

Fire Engine Harness (continued).

Plain Winker Stays	...	...	...	...	1¼	by 12½in.
„ „ „ split	...	...	...	...	5/8	by 7½in.
Shoulder Tugs	...	...	...	...	1¾	by 18in.
Traces	...	...	...	...	1¾	by 74in.
Hame Straps (top only)	...	...	...	...	7/8	by 22in.

REINS.

Drafts	...	...	...	1	by 84in.
Couplings	...	...	...	1	by 80in.
Billets	...	...	...	1	by 13in.
Handparts	...	...	...	1	by 72in.

PARTICULARS.—Heads split, and a 7/8 dee sewn in each to receive spring hook in throat. Throatbands made up with a buckle in one end, and a 3in. spring hook in the other end for near side. Nosebands slide on cheek billets, no chin pieces or points. No bearing reins or throat swivels. Driving Reins: Drafts and couplings with billets ordinary style. A 5in. spring hook put on to each billet (loose). Handparts plaited or with stops sewn on. A 7/8in. dee sewn in one end of handparts, and a 3in. spring hook in the other end for rapid coupling. Traces made with D-shaped draw eyes with removable screwed stems. The sway-bar hook is sewn to a leather slide piece—same as a Martingale ring for gig harness—which slides on the top hame strap and holds sway-bar and traces ready for use. Collars should be wide enough to go on easily to prevent delay in harnessing the horses. Bits: Liverpool, or any cheeked bits, must take the spring hooks easily.

SINGLE HORSE VAN HARNESS.**BRIDLE.**

Head	...	...	1¾	by 24in.
Head, split	...	...	7/8	by 7in.
Front, cut	...	...	1¾	by 22in.
Front, within	...	...	1¾	by 16in.
Noseband	...	...	1¼	by 33in.
, centre	...	...	14in.	
, point	...	...	7/8	by 7in.
Throatband made up	...	...	7/8	by 21in.
Winker Rounding	...	...	1¾	by 13in.
, „ point	1	by	8in.	
Cheeks, made up	1	by	9in.	
Cheeks, billets	...	1	by	12½in.
Winkers	...	...	6¼	by 6¾in.

SADDLE.

Girth	...	...	2½	by 28in.
, lay	...	...	1¼	by 11in.
, strap	...	...	1¼	by 18in.

Backband	...	...	1¾	by 105in.
, middle	...	...	48in.	
, point	...	...	20in.	
Shaft Tugs, cut	...	...	1¾	by 32in.
, „ between holes	...	...	16in.	
, „ linings	...	...	1¾	by 15in.

CRUPPER.

Body	...	...	2	by 25in.
Body, split	...	...	8½in.	
Body, lay	...	...	1¼	by 16in.
Strap	...	...	1¼	by 46in.
Dock	...	...	4	by 17½in.

BREECHING.

Seat	...	...	2	by 45in.
Tugs	...	...	1½	by 6in.
Placed from rings	...	...	8in.	
Loin strap	...	...	2¼	by 52in.
, „ split	...	...	16in.	

Single Horse Van Harness (continued).**TRACES.**

Chain End and sewn
to hame ring ... $1\frac{3}{4}$ by 60in.

REINS.

Drafts $1\frac{1}{8}$ by 84in.
Handparts $1\frac{1}{8}$ by 78in.
Billets $1\frac{1}{8}$ by 14in.

Hame Strap (top) ... $\frac{7}{8}$ by 24in.
.. .. (bottom) $\frac{7}{8}$ by 19in.

If with box-top saddle :—

Backband with chain ends.
Middle only ... $1\frac{3}{4}$ by 33in.
Girth $1\frac{1}{2}$ by 64in.
,, strap $1\frac{1}{2}$ by 27in.

PAIR-HORSE VAN HARNESS (Pole).**BRIDLES.**

Heads 1 by 24in.
,, safe $2\frac{1}{4}$ by 8in.

Throats (to go over
head) $1\frac{1}{8}$ by 42in.

Nosebands $1\frac{1}{4}$ by 33in.
,, centre 14in.

,, point ... 1 by 7in.
Winkers $6\frac{5}{8}$ by $6\frac{7}{8}$ in.

Winker rounding $1\frac{1}{8}$ by 13in.
,, ,, strap 1 by 8in.

Fronts, made up ... $1\frac{3}{8}$ by 25in.
,, between head slides 15in.

,, throat slides formed at
extreme ends.

COLLARS.

No Meter Straps to Collars.

TRACES, Chain Ends.

Shoulder part ... $1\frac{3}{4}$ by 15in.
Drafts $1\frac{3}{4}$ by 50in.

PADS.

Surcingsles, off side $2\frac{1}{2}$ by 45in.
near side $2\frac{1}{2}$ by 14in.
,, lays ... $1\frac{1}{4}$ by 12in.
,, straps ... $1\frac{1}{8}$ by 20in.

Bellybands $1\frac{1}{2}$ by 32in.
. points ... $1\frac{1}{2}$ by 16in.

CRUPPERS.

Bodies, cut 3 by 42in.
,, made up ... 3 by 39in.
,, split, front only 13in.
,, lay $2\frac{1}{4}$ by 25in.
,, reach just long enough to
form safe for hip strap dee.

BREECHINGS.

Seats, made up ... $2\frac{1}{4}$ by 70in.
,, lays made up $1\frac{1}{8}$ by 68in.
Loin straps $1\frac{1}{4}$ by 44in.
Hip straps points ... $1\frac{1}{8}$ by 17in.
Hip straps, brace
pieces $1\frac{1}{2}$ by 8in.
Tugs (8) $1\frac{1}{4}$ by $5\frac{1}{2}$ in.
First tug from ring $13\frac{1}{2}$ in.
Between tugs $4\frac{1}{2}$ in.

REINS.

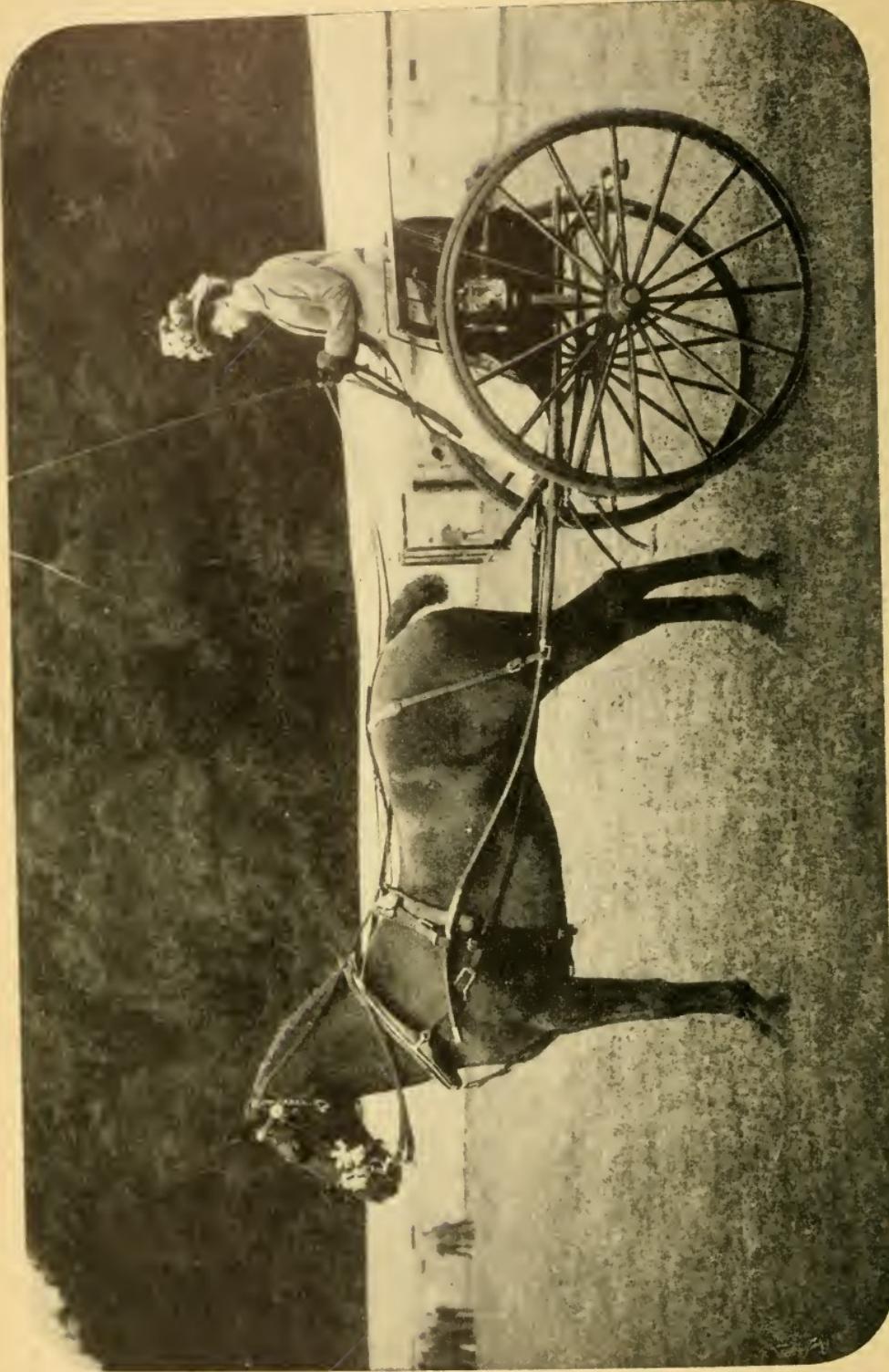
Made up $1\frac{1}{8}$ by 168in.
Couplings $1\frac{1}{8}$ by 80in.

Hip Straps each made with two points sewn to a ring, which is then connected to Crupper dee by a brace piece. Safes cut and fixed under rings.

HANSOM CAB HARNESS.**BRIDLE.**

Head $1\frac{3}{4}$ by 23in.
,, split 7in.
Cheeks, cut $\frac{7}{8}$ by 30in.
,, made up ... 8in.
Front, cut $1\frac{1}{4}$ by 21in.
,, within 13in.
Throat, cut $\frac{7}{8}$ by 26in.

Throat, made up ... 19in.
Nose, cut $1\frac{1}{4}$ by 30in.
,, middle ... 12in.
,, point $\frac{7}{8}$ by 6in.
,, space for billets $1\frac{1}{8}$ in.
Winker stay ... $1\frac{1}{4}$ by 12in.
,, ,, split $7\frac{1}{2}$ in.
,, point reduced to $\frac{7}{8}$ in.



Hansom Cab Harness (*continued*).**SADDLE.**

Girth	...	...	2½ by 27in.
"	lay	...	1¼ by 10in.
"	long loop	...	1 by 9in.
Girth Strap	...	...	1¼ by 18in.

BACKBAND.

Backband	...	...	1¾ by 100in.
"	middle	...	41in.
"	point	...	18in.
Shaft Tugs, cut	...	1¾ by 27in.	
"	between holes	...	13in.
"	linings	...	12½in.

CRUPPER.

Crupper, body	...	1¾ by 23in.	
"	split	...	8in.
"	lay	...	1¼ by 15in.
"	strap	...	1¼ by 42in.
"	dock, cut	...	4 by 17in.

BREECHING.

Loin Strap, cut	...	1¾ by 52in.	
"	split	...	17in.
Breeching Seat	...	1½ by 42in.	
"	tugs	...	¾ by 5½in.
Shaft Straps	...	...	1¼ by 30in.

TRACES.

Chain ends, and			
	sewn to hame rings	1½ by 57in.	

REINS.

Reins, drafts	...	...	1½ by 84in.
"	extra pieces	...	1½ by 78in.
"	handparts	...	1½ by 78in.
"	billets	...	1½ by 13in.

MARTINGALE.

Martingale, body	...	1¼ by 38in.	
"	billet	...	1 by 10in.

(It is an improvement to cut winker and loin-straps wider, and cut a piece out of centre of split part).

FULL-SIZE GIG HARNESS.**BRIDLE.**

Head, cut	...	...	1½ by 23in.
"	split	...	6¼in.
Cheeks, cut	...	...	¾ by 30in.
"	made up	...	8in.
"	allow for billets	...	12in.
Noseband, cut	...	1¼ by 29in.	
"	swelled centre	...	12in.
"	point	...	¾ by 6in.
"	billet spaces	...	1in.

Throat, cut	...	...	¾ by 27in.
"	made up	...	19½in.

Chain Front, lining			
cut	...	...	1½ by 21in.
"	between	...	13in.

Winker stay	...	...	1¾ by 12½in.
"	split	...	7½in.
"	rounding	...	1 by 13½in.
"	"	point	¾ by 6in.

HAMES AND TRACES.

Hame Tugs, cut	...	1½ by 18in.	
"	"	made up	9in.
"	"	safes to pattern	12in.
Hame strap (top)	...	¾ by 19in.	
"	"	(bottom)	¾ by 18in.
Traces, made up	...	1½ by 72in.	

SADDLE.

Girth, cut	...	...	2¼ by 27in.
"	short lay	...	1½ by 11in.
Girth, large loop	...	1	by 8in.
Girth strap	...	...	1½ by 18in.

BACKBAND.

Backband	...	...	1½ by 96in.
"	point	...	18in.
"	middle	...	39in.
Shaft Tugs, cut	...	1½ by 24in.	
Shaft Tugs, between holes	...	12in.	
Shaft Tugs, linings	...	12in.	

Full-Size Gig Harness (*continued*).

CRUPPER.

Body	... ...	1½ by 23in.
" split	... ...	8in.
Lay	... ...	1½ by 15in.
Strap	... ...	1½ by 42in.
Dock	... ...	3¾ by 18in.

BREECHING.

Seat	... ...	1½ by 42in.
Tugs (4)	... ...	¾ by 5in.
Tugs placed from ends		6in.
Shaft Straps	... ...	1½ by 32in.
Hip Strap	... ...	1½ by 52in.
" "	split	17in.

KICKING STRAP.

For two wheeler	... 1¼	by 66in.
For four wheeler	... 1¼	by 74in.
Tugs	... ...	1¼ by 14in.

REINS.

Driving Reins, drafts	1	by 78in.
" handparts	1	by 72in.
" billets	1	by 13in.
Bearing Rein,		
middle	... ...	¾ by 78in.
Bearing Rein, round-		
ing cut	1	by 23in.
" made up		18in.
Bearing Rein, billets	¾	by 10½in.

SHORT MARTINGALE.

Body, cut	... ...	1 by 36in.
" made up	... ...	1 by 24in.
Billet	... ...	1 by 14in.

LONG MARTINGALE.

Rounding, cut	... 1	by 24in.
" made up		22in.
Body	... ...	1 by 39in.
Patchpiece to pattern.		

COB-SIZE GIG HARNESS.

BRIDLE.

Head, cut	... 1½	by 21½in.
" split	... ...	5¾in.
Cheeks, cut	... ...	¾ by 28in.
" made up	... ...	7in.
" billets	... ...	12in.
Noseband, cut	... 1½	by 27in.
" swelled centre	... ...	11in.
" point	... ...	¾ by 5½in.
" billet spaces	... ...	1in.
Chain Front, lining	cut	... ... 1½ by 20in.
Chain Front, between		12in.
Winker Stay	... 1¼	by 11½in.
" " split	... ...	6¾in.
Winker, rounding	... 1	by 12in.
" " point	... ...	¾ by 5½in.
Throat, cut	... ...	¾ by 26in.
" made up	... ...	18½in.

HAMES AND TRACES.

Hame Tugs, cut	... 1¾	by 16in.
" " made up	... ...	8in.
" " safes to pattern	... ...	11in.
Hame Strap (top)	... ...	¾ by 18in.
" " (bottom)	... ...	¾ by 17in.
Traces, made up	... 1¾	by 66in.

SADDLE.

Girth, cut	... ...	2 by 24in.
" short lay	... 1	by 10in.
Girth, large loop	... ...	¾ by 6½in.
Girth Strap	... ...	1 by 17in.

BACKBAND.

Backband	... ...	1¾ by 90in.
" point	... ...	17in.
" middle	... ...	36in.
Shaft Tugs, cut	... 1¾	by 23in.
" " between holes	... ...	11½in.
" " linings	... ...	11¼in.

CRUPPER.

Body	... ...	1½ by 21½in.
" split	... ...	7in.
Lay	... ...	1 by 14in.
Strap	... ...	1 by 39in.
Dock	... ...	3½ by 17in.

BREECHING.

Seat	... ...	1¾ by 39in.
Tugs (4)	... ...	¾ by 5in.
" placed upon ends	... ...	5½in.
Shaft Straps	... ...	1 by 30in.
Hip Strap	... ...	1½ by 48in.
" " split	... ...	16in.

Cob-Size Gig Harness (*continued*).**KICKING STRAP.**

For two wheeler ... $1\frac{1}{8}$ by 60in.
 For four wheeler ... $1\frac{1}{8}$ by 68in.
 Tugs $1\frac{1}{8}$ by 13in.

REINS.

Driving Reins, drafts $\frac{7}{8}$ by 72in.
 " handparts $\frac{7}{8}$ by 66in.
 " billets $\frac{7}{8}$ by 12in.
 Bearing Rein, middle $\frac{3}{4}$ by 69in.
 Bearing Rein, roundings, cut ... 1 by $21\frac{1}{2}$ in.
 " made up ... 17in.
 Bearing Rein, billets $\frac{3}{4}$ by 10in.

SHIORT MARTINGALE.

Body, cut $\frac{7}{8}$ by 35in.
 " made up ... $\frac{7}{8}$ by 21in.
 Billet $\frac{7}{8}$ by 13in.

LONG MARTINGALE.

Rounding cut ... 1 by 22in.
 " made up ... 20in.
 Body $\frac{7}{8}$ by 36in.
 Patchpiece to pattern.

PONY-SIZE GIG HARNESS.**BRIDLE.**

Head, cut $1\frac{1}{4}$ by 20in.
 " split $5\frac{1}{4}$ in.
 Cheeks, cut $\frac{5}{8}$ by 25in.
 " made up ... 6in.
 " billets 11in.
 Noseband, cut ... 1 by 25in.
 " swelled centre 10in.
 " point ... $\frac{5}{8}$ by 5in.
 " billet spaces $\frac{7}{8}$ in.
 Throat, cut $\frac{5}{8}$ by 25in.
 " made up ... $17\frac{1}{2}$ in.
 Chain Front, lining
cut 1 by 19in.
 Chain Front, between 11in.
 Winker Stay $1\frac{1}{8}$ by $10\frac{1}{2}$ in.
 " split $6\frac{1}{4}$ in.
 Winker rounding $\frac{7}{8}$ by $10\frac{1}{2}$ in.
 " rounding point $\frac{5}{8}$ by 5in.

SADDLE.

Girth, cut $1\frac{1}{8}$ by 22in.
 Girth, short lay ... $\frac{7}{8}$ by 9in.
 " large loop ... $3\frac{1}{4}$ by 6in.
 " Strap $\frac{7}{8}$ by 16in.

BACKBAND.

Backband $1\frac{1}{4}$ by 84in.
 " point 16in.
 " middle ... 34in.
 Shaft Tugs, cut ... $1\frac{1}{4}$ by 22in.
 " " between holes 11in.
 " " linings $10\frac{1}{2}$ in.

CRUPPER.

Body $1\frac{1}{4}$ by 20in.
 " split 6in.
 Lay $\frac{7}{8}$ by 13in.
 Strap $\frac{7}{8}$ by 36in.
 Dock $3\frac{1}{4}$ by 16in.

BREECHING.

Seat $1\frac{1}{4}$ by 36in.
 Tugs (4) $\frac{7}{8}$ by $4\frac{1}{2}$ in.
 Tugs placed from ends 5in.
 Shaft Straps $\frac{7}{8}$ by 28in.
 Hip Strap $1\frac{1}{4}$ by 44in.
 " " split ... 15in.

HAMES AND TRACES.

Hame Tugs, cut ... $1\frac{1}{4}$ by 14in.
 " " made up 7in.
 " " safes to pattern 10in.
 Hame Strap (top) ... $\frac{5}{8}$ by 17in.
 " " (bottom) $\frac{5}{8}$ by 16in.
 Traces, made up ... $1\frac{1}{4}$ by 63in.

Pony-Size Gig Harness (continued).

KICKING STRAP.

For two wheeler ... 1 by 54in.
For four wheeler ... 1 by 62in.
Tugs 1 bv 12in.

REINS.

Driving Reins, drafts $\frac{3}{4}$ by 66in.
" handparts $\frac{3}{4}$ by 60in.
" billets $\frac{3}{4}$ by 11in.
Bearing Rein, middle $\frac{5}{8}$ by 60in.
Bearing Rein, round-
ings, cut ... $\frac{7}{8}$ by 20in.
" made up ... 16in.
Bearing Rein, billets $\frac{5}{8}$ by $9\frac{1}{2}$ in.

SHORT MARTINGALE.

Body, cut	... ...	$\frac{3}{4}$ by 30in.
"	made up	$\frac{3}{4}$ by 18in.
Billets	... ...	$\frac{3}{4}$ by 12in.

LONG MARTINGALE.

Rounding, cut	... ...	$\frac{7}{8}$ by 20in.
"	made up	18in.
Body	... ...	$\frac{3}{4}$ by 34in.
Patchpiece to pattern.		

BACKBANDS, BREECHINGS, &c., FOR GIG HARNESS.

FULL-SIZE.

BACKBANDS (Various).

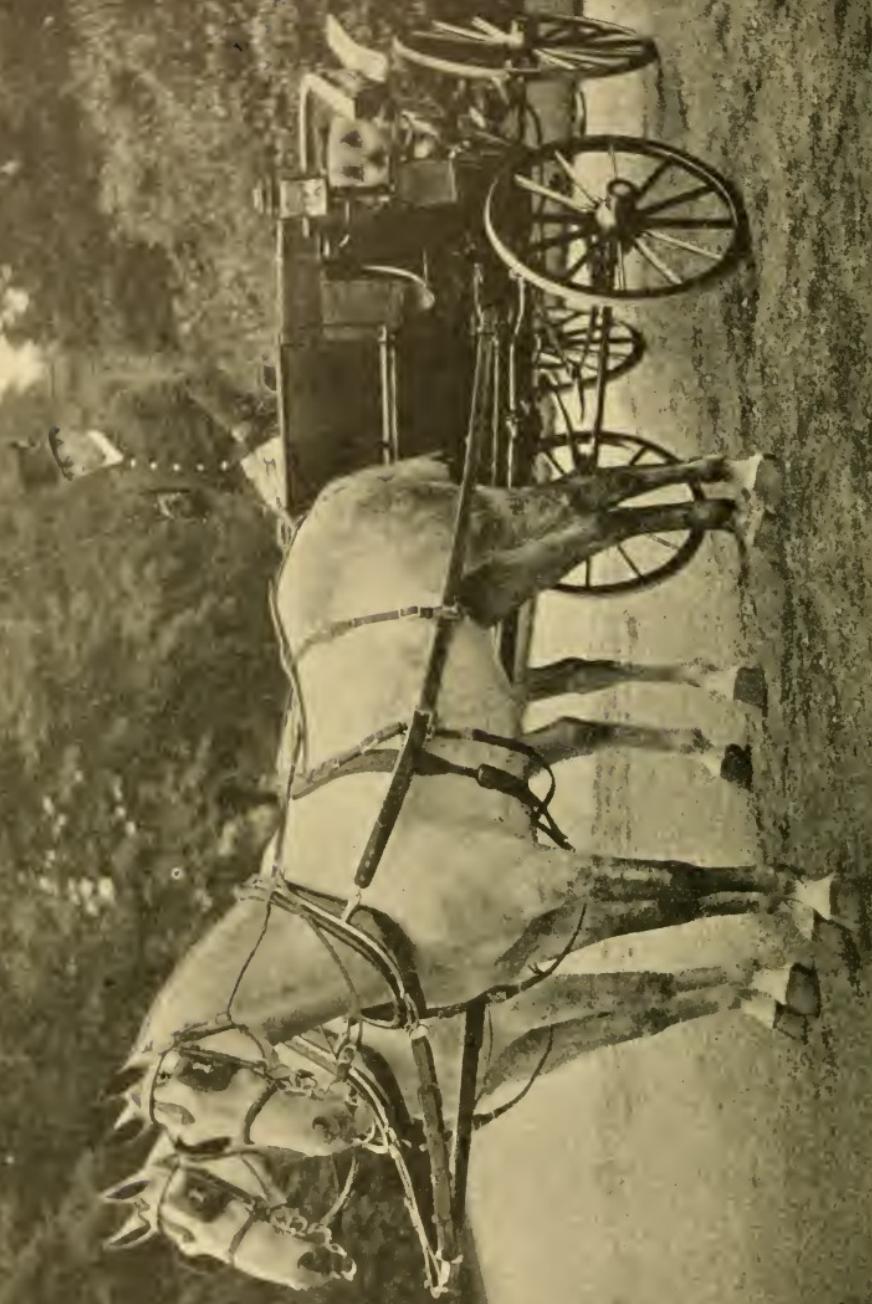
French, centre	... ...	$1\frac{1}{2}$ by 39in.
" points sewn on tugs	... ...	$1\frac{1}{2}$ by 24in.
Tilbury, full length	... ...	$1\frac{1}{2}$ by 105in.
" with two points	... ...	$1\frac{1}{2}$ by 90in.
" each point	... ...	18in.
" centre	... ...	34in.
" reversed sewing each side of centre		13in.
Bellyband, for either French or Til- bury backband	... ...	$1\frac{1}{2}$ by 28in.
False backband for 2 wheeler, middle	$1\frac{1}{2}$	by 26in.
" " " billets (2)	$1\frac{1}{2}$	by 24in.
False bellyband for 2 wheeler, middle	$1\frac{1}{2}$	by 32in.
" " " billets	$1\frac{1}{2}$	by 24in.

BREECHINGS (Various).

Buckle Seat, cut	... ...	$1\frac{1}{2}$ by 36in.
" lay	... ...	$1\frac{1}{8}$ by 36in.
" between buckles	... ...	32in.
Ring points, made up	... ...	$1\frac{1}{8}$ by 9in.
Long Breeching	... ...	$1\frac{3}{8}$ by 126in.
" reduced for turnback to		1in.
Crupper, Martingale style	... ...	$1\frac{1}{2}$ by 50in.
" reduced for turnback to		1in.

BREAST COLLAR.

Body (folded leather)	... ...	$2\frac{1}{2}$ by 39in.
Body	... ...	$1\frac{1}{2}$ by 39in.
" between buckles	... ...	33in.
Neck Strap	... ...	$1\frac{3}{4}$ by 40in.
" reduced at points to		1in.



Backbands, Breechings, &c., for Gig Harness (*continued.*)

COB SIZE.

BACKBANDS (Various).

French, centre	... ... ... ...	1 $\frac{3}{8}$	by	36in.
," points sewn on tugs	... ...	1 $\frac{3}{8}$	by	21in.
Tilbury, full length	... ... ... ...	1 $\frac{3}{8}$	by	99in.
," with two points	... ... ... ...	1 $\frac{3}{8}$	by	87in.
," each point	... ... ... ...			17in.
," centre	... ... ... ...			32in.
," reversed sewing each side of centre				12in.
Bellyband for either French or Tilbury	1 $\frac{3}{8}$	by	26in.	
False backband for two wheeler,				
middle	... ... ... ...	1 $\frac{3}{8}$	by	23in.
False backband for two wheeler,				
billets	... ... ... ...	1 $\frac{3}{8}$	by	22in.
False bellyband for two wheeler,				
middle	... ... ... ...	1 $\frac{3}{8}$	by	29in
False bellyband for two wheeler,				
billets	... ... ... ...	1 $\frac{3}{8}$	by	22in

BREECHINGS (Various).

Buckle Seat, cut	... ... ... ...	1 $\frac{3}{8}$	by	33in.
," lay	... ... ... ...	1	by	33in.
," between buckles	... ...			29in.
Ring points, made up	... ... ... ...	1	by	8in.
Long Breeching	... ... ... ...	1 $\frac{1}{4}$	by	114in.
," reduced for turnback to				1in.
Crupper, Martingale style	... ...	1 $\frac{3}{8}$	by	44in.
," reduced for turnback to...	...			1in.

BREAST COLLAR.

Body (folded leather)	... ... ... ...	2 $\frac{1}{4}$	by	33in.
Lay	... ... ... ...	1 $\frac{3}{8}$	by	33in.
," between buckles	... ... ...			27in.
Neck Strap	... ... ... ...	1 $\frac{1}{2}$	by	34in.
Reduced at point to	... ... ... ...			7/8in.

PONY SIZE.

BACKBANDS (Various).

French, centre	... ... ... ...	1 $\frac{1}{4}$	by	33in.
," points sewn on tugs	... ... ...	1 $\frac{1}{4}$	by	18in.
Tilbury, full length	... ... ... ...	1 $\frac{1}{4}$	by	93in.
," with two points	... ... ... ...	1 $\frac{1}{4}$	by	84in.
," each point	... ... ... ...			16in.
," centre	... ... ... ...			30in.
," reversed sewing each side of centre				11in.
Bellyband, for either French or Tilbury	... ...	1 $\frac{1}{4}$	by	24in.
False backband for two wheeler, middle	... ...	1 $\frac{1}{4}$	by	20in.
," " " " billets	... ...	1 $\frac{1}{4}$	by	20in.
False bellyband for two wheeler, middle	... ...	1 $\frac{1}{4}$	by	26in
," " " " billets	... ...	1 $\frac{1}{4}$	by	20in

Backbands, Breechings, &c., for Gig Harness (*continued.*)

BREECHINGS.

Buckle Seat, cut	... ... ...	$1\frac{1}{4}$	by	30in.
" " lay	... ... ...	$\frac{7}{8}$	by	30in.
" " between buckles	... ... ...			26in.
Ring points, made up	... ... ...	$\frac{7}{8}$	by	7in
Long Breeching	... ... ...	$1\frac{1}{8}$	by	102in
" " reduced for turnback to				$\frac{7}{8}$ in.
Crupper, Martingale style	... ... ...	$1\frac{1}{4}$	by	38in.
" " reduced for turnback to				$\frac{7}{8}$ in.

BREAST COLLAR.

Body (folded leather)	... ... ...	2	by	27in.
Lay	... ... ...	$1\frac{1}{4}$	by	27in.
" " between buckles	... ... ...			21in.
Neck Strap	... ... ...	$1\frac{1}{4}$	by	28in.
" " reduced points to				$\frac{3}{4}$ in.

PAIR-HORSE HARNESS.

FULL-SIZE.

BRIDLES as Gig.

HAMES AND TRACES.

Hame Tugs, made up	... ...	$1\frac{1}{2}$	by	18in.
Hame Tugs, safes to pattern	... ...	21in.		
Short Tugs, to hame tug buckles	... ...	$1\frac{1}{8}$	by	5in.
Hame Straps (top only)	... ...	$\frac{3}{4}$	by	22in.
Traces	... ...	$1\frac{1}{2}$	by	78in.
" hand leather	... ...	$1\frac{1}{2}$	by	5in.
Pole pieces	... ...	$1\frac{1}{2}$	by	60in.

PADS.

Tops to pattern.				
Girths, near side	... $2\frac{1}{4}$	by	15in.	
" off side	... $2\frac{1}{4}$	by	42in.	
" points	... $1\frac{1}{8}$	by	18in.	
Pad End Straps	... $1\frac{1}{8}$	by	9in.	

CRUPPERS, same as Gig.

Loin Straps	... ...	1	by	50in.
Trace Carriers, cut	1	by	14in.	
Patent Leather to pattern.				

BREECHINGS.

Breechings, cut	... $1\frac{3}{8}$	by	132in.	
Breechings reduced at buckles to	... ...	$1\frac{1}{8}$	in.	

REINS.

Driving Reins, each side				
" couplings	1	by	168in.	
" billets	1	by	80in.	
Bearing Rein, full bradoon, middle	$\frac{3}{4}$	by	72in.	
" roundings, cut	1	by	31in.	
" " made up				24in.

MARTINGALES.

Body, cut	... ...	1	by	36in.
" made up	... ...	1	by	24in.
Billets	... ...	1	by	14in.

COB SIZE.

BRIDLES as Gig.

HAMES AND TRACES.				
Hame Tugs, made up	... ...	$1\frac{3}{8}$	by	16in.
Hame Tugs, safes to pattern	... ...			19in.
Short Tugs, sewn to hame tug buckles	1	by	4 $\frac{1}{2}$ in.	
Hame Straps (top only)	... ...	$\frac{3}{4}$	by	21in.

Traces, made up	... $1\frac{3}{8}$	by	75in.	
" hand leather	$1\frac{3}{8}$	by	5in.	
Pole pieces	... ...	$1\frac{3}{8}$	by	57in.

Pair-Horse Harness (*continued*).**Cob Size (*continued*.)****PADS.**

Tops to pattern.

Girths, near side ... 2 by 13in.

" off side ... 2 by 39in.

Girth point ... 1 by 17in.

Pad End Straps ... 1 by 9in

CRUPPERS, same as Gig.

Loin Straps ... 1 by 48in

Trace Carriers, cut 1 by 13in.

Patent Leather to pattern.

BREECHINGS.Breechings, cut ... 1 $\frac{1}{4}$ by 120in.

Breechings, reduced

at buckles to ... 1in.

PONY SIZE.**BRIDLES, as Gig.****HAMES AND TRACES.**Hame Tugs, made up 1 $\frac{1}{4}$ by 14in.

" safes to pattern ... 17in.

Short Tugs, sewn to hame tug
buckles 7/8 by 4in.

Hame Straps (top only) 5/8 by 20in.

Traces, made up 1 $\frac{1}{4}$ by 72in" hand leather 1 $\frac{1}{4}$ by 4 $\frac{1}{2}$ in.Pole pieces 1 $\frac{1}{4}$ by 54in.**PADS.**

Tops to pattern.

Girths, near side 1 $\frac{3}{4}$ by 11in." off side 1 $\frac{3}{4}$ by 36in.

Girth points 7/8 by 16in.

Pad-end Straps 7/8 by 8in.

CRUPPERS, same as Gig.

Loin Straps 7/8 by 46in.

Trace Carriers, cut 7/8 by 12in.

Patent leather to pattern.

BREECHINGS.Breechings, cut 1 $\frac{1}{8}$ by 108in.

" reduced at buckles to ... 7/8

REINS.

Driving Reins, each side 7/8 by 156in.

" couplings 7/8 by 75in.

" billets 7/8 by 12in.

Bearing Rein, full bradoon,

middle 5/8 by 66in.

" " roundings, cut ... 7/8 by 25in.

" " " made up ... 7/8 by 18in.

MARTINGALES.

Body, cut 3/4 by 30in.

" made up 3/4 by 18in.

" billets 3/4 by 12in.

REINS.

Driving Reins, each side

1 by 162in.

" couplings 1 by 78in.

" billets 1 by 13in.

Bearing Rein, full

bradoon, middle 3/4 by 69in.

" roundings, cut 1 by 28in.

" " made up 21in.

MARTINGALES.

Body, cut 7/8 bv 33in.

" made up 7/8 by 21in.

Billets 7/8 by 13in.

THREE-HORSE BUS HARNESS (for Horses to Run Abreast).

Bridles as ordinary Van Harness.

Breechbands 10ft. long altogether by $1\frac{3}{4}$ in. wide, spliced in the centre, lined in the middle from 3ft. 3in. to 4ft. From each end of Breechband tapered 16in. to $1\frac{1}{2}$ in.

Buckle-pieces for Loin Straps made up, $4\frac{1}{2}$ in. by $1\frac{1}{4}$ in.

Put in body of Breechband 18in. each way from centre of Breechband.

Hip Straps, 4ft. 6in. long by $1\frac{1}{4}$ in.

Cross Straps to go from Hip Strap Pad to Hame Ring at Draft, 4ft. long by $\frac{3}{4}$ in. wide. Billet on Cross Straps, front end, 15in. long. Back end of Cross Strap turned back to form a loop for Hip Strap to run through.

Pad for top of hips (for Loin Strap to run through, and Cross Straps to Hame Ring), 10in. long by $2\frac{1}{4}$ in. wide, made of fair strength of leather; a loop sewn on either end of Hip Strap to run through. Make a pad of $\frac{1}{4}$ in. felt, covered with soft black leather or basil, and sew under the leather pad with loops on. Sew Hip Strap 1 row across in the centre to hold the pad in its place, and it leaves the ends loose to run the loops of the Cross Straps on the Loin Straps.

HAMES AND TRACES.

Ring on the Draft of Hames.

From Ring to Square, double leather 18in. long by 2in. wide.

Square, 2in. wide (inside) by 4in. long (inside). Bar across centre with tong to form a buckle to take the Breechband. Two loops on Hame Tug to take point of Breechband.

Back ends of Traces from Square to Chain, 3ft. 10in. long, made up, by $2\frac{1}{4}$ in. or $2\frac{1}{2}$ in. broad. Single Traces tapered at each end to fit on Square and Chain.

TANDEM HARNESS.

WHEELER.—Same as Gig Harness.

LEADER.

Bridle, Crupper, etc., as Gig Harness.

Traces, full size	...	...	$1\frac{1}{2}$	by 120in.
„ cob size	...	...	$1\frac{3}{8}$	by 114in.
„ pony size	...	...	$1\frac{1}{4}$	by 108in.
Reins, full size	...	...	1	by 288in. each side.
„ cob size	...	...	$\frac{7}{8}$	by 276in. „
„ pony size	...	...	$\frac{3}{4}$	by 264in. „

FOUR-IN-HAND HARNESS.

WHEELER.—Same as Pair-Horse Harness.

LEADER.

Traces 1½ by 66in.

Reins : Drafts, couplings, and billets as Wheeler.

Handparts, extra lengths added to make up to 24in. each side.

FUNERAL CARRIAGE HARNESS.

WHEELER.

BRIDLE.

Ordinary carriage, with the exception of a safe to the head. This is cut 7 inches long by 5 inches wide. The two corners of one side are well rounded off—this part comes to the back of the head—the straight edge of the safe being placed in a line with the head about half an inch in front. Check Rein : 5⅛in. wide by 30in. long. Billet each end, 5⅛in. by 8in.

BREAST COLLAR

Body, 60in. by 5in., lined for safes at each end only, 12in. Layer, 34in. by 1¾in. (if for 1¾in. traces). Polestrap dee placed 3in. from centre of collar. In making the collars see that this dee is placed on the pole side of each, or they will not be a pair of collars. Tugs for wither strap made up 5½in. by 1¼in. and placed 9in. from the heel of each trace buckle. If box loops are to be used, cut these 6¾in. by 5¼in. Wither strap cut 44in. by 1¼in., wither strap safe 25in. by 2½in. Polestraps, 60in. by 1¾in. See following sketch for method of letting in rein dees.



PADS (Ordinary Carriage).

With pad leathers 24in. by 6½in., if with two rows of beading. Short tugs and point straps same as for ordinary carriage harness. Girths, near side, 16in. by 2¼in.; off side, 44in. by 2¼in.; strap, 18in. by 1½in.

BREECHING.

Long Breeching, 120in. by 2¼in. Five feet of the centre part is left the full width, then tapered off towards each end to 15⅛in. Breeching Tugs 30in. between at the seat, and 4in. between at the sides. Loin strap and crupper (ordinary).

TRACES (with loop ends).

These are cut 1¾in. by 93in., then when they are turned and the loop is formed should measure 78in. from point to end of loop.

REINS.

Drafts 84in. by 1in., couplings 78in. by 1in., handparts 84in. by 1in., billets 14in. by 1in.

Funeral Carriage Harness (*continued*).

LEADER.

Bridles, wither straps, and breast collars same as Wheeler, with the exception that there are no pole-dees inserted in the latter.

Traces with cock eyes, $1\frac{1}{2}$ in. by 70in.

1.in Strap, 52in. by $1\frac{1}{4}$ in. Trace bearers, cut 17in. by $1\frac{1}{4}$ in.

Reins: Drafts, couplings, and billets as above. Extra strips added to make up to 25ft. each side.

AMERICAN PAIR-HORSE HARNESS.

BRIDLE.

Crown pieces	... 1 $\frac{3}{8}$	by 23in.
" "	split	$\frac{5}{8}$ by 7in.
" "	layers	$\frac{5}{8}$ by 9in.
Cheeks, cut	... ...	$\frac{5}{8}$ by 29in.
" made up	...	8in.
Nosebands, cut	... 1 $\frac{1}{4}$	by 30in.
" middle	...	12 $\frac{1}{2}$ in.
" point	... ...	$\frac{5}{8}$ by 5 $\frac{1}{2}$ in.
" buckle piece	$\frac{5}{8}$	by 9in.
" billet spaces	...	$\frac{7}{8}$ in.
Winkers (square)	... 5 $\frac{1}{2}$	by 6 $\frac{1}{4}$ in.
Throatbands	... ...	$\frac{5}{8}$ by 26in.
Checks or bearing-		
rein roundings	... $\frac{3}{4}$	by 22in.
Centre parts	... ...	$\frac{3}{4}$ by 60in.
Fronts made up	... 1 $\frac{1}{4}$	by 13in.
Winker braces	... 1 $\frac{1}{8}$	by 13 $\frac{1}{2}$ in.
" split	... ...	$\frac{1}{2}$ by 8in.
" point	... ...	$\frac{5}{8}$ by 5 $\frac{1}{2}$ in.

HAMES AND TRACES.

Hame Tugs, made up	... ...	1 $\frac{1}{4}$ by 17in.
Hame Tug Safes—		
1 $\frac{3}{4}$ & 2 $\frac{3}{4}$ by 20 $\frac{1}{2}$ in.		

Hame Strap (top) ... $\frac{3}{4}$ by 26in.
Traces 1 $\frac{1}{4}$ by 82in.

AMERICAN BUGGY HARNESS.

BRIDLE.

Head	... ...	1 $\frac{1}{4}$ by 23in.
" split	... ...	$\frac{1}{2}$ by 7in.
Cheeks, cut	... ...	$\frac{1}{2}$ by 28in.
" made up	...	7 $\frac{3}{4}$ in.
Front between	... ...	$\frac{5}{8}$ by 12 $\frac{1}{2}$ in.
Throat	... ...	$\frac{1}{2}$ by 20in.
Winker Stay	... ...	1 by 12in.
" "	split	$\frac{3}{8}$ by 7in.

BRIDLE (*continued*).

Winker Stay, billet	$\frac{1}{2}$	by 5in.
Overcheck	... ...	1 by 30in.
" split	... ...	$\frac{1}{2}$ by 10in.
" point	...	$\frac{1}{2}$ in.
" nose piece	$\frac{3}{8}$	by 9in.
" check rein	$\frac{1}{2}$	by 30in.
" billets	...	$\frac{1}{2}$ by 6 $\frac{1}{2}$ in.

American Buggy Harness (continued).**BREAST COLLAR.**

Body	... ... 2	by 36in.
Neck Strap	... ... 1½	by 38in.
" "	points	5½in.
" "	tugs cut	5½ by 7in.
Traces	... ... 1	by 84in.
"	lap on breast collar	12in.

SADDLE.

Tree	... ... ...	3in.
Skirts	... ... ...	2½ by 3in.
Jockeys	... ... ...	2¾ by 4½in.
Flaps	... ... ...	2½ by 22in.
Backband points	... ...	5/8 by 20in.
Tugs, cut	... ...	5/8 by 20in.
" between holes		9in.
Bellyband (Griffiths)	1¾	by 18in.
" billets	... 5/8	by 26in.

CRUPPER.

Turn back style	... 1¼	by 44in.
Body 1¼	by 20in.
" split 5/8	by 8in.

Turn back reduced
to 5/8

Dock 3½	by 14in.
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BREECHING.

Body 2	by 38in.
" layers cut	... 1½	by 14in.
" rounds cut	... 7/8	by 12in.
" from D to end		6½in.
Shaft Straps	... ... ¾	by 30in.
Hip Straps	... ... 5/8	by 43in.
" " tugs cut	5/8	by 7in.

REINS.

Drafts	... ... ... 7/8	by 78in.
Handparts	... ... 1	by 72in.

DONKEY HARNESS.**BRIDLE.**

Head, cut	... ... 1¼	by 19in.
Head, split	... ... 5/8	by 5in.
Cheeks, cut	... ... 5/8	by 26in.
Cheeks, made up		6in.
Front, cut	... ... 1	by 18in.
Front, within		12in.
Throat Band, cut	5/8	by 18in.
Throat Band, made up		14in.
Noseband, cut	... 1	by 23in.
" middle		10in.
" point	... 5/8	by 5in.
Flat Winker Stay, cut	... ... 1	by 11in.
" " split	½	by 6½in.
" " point	3/8	by 4½in.
Rounded Winker Stay, cut	... ... 5/8	by 10in
" " point	5/8	by 5in.

HAMES AND TRACES.

Hame Tugs	... ... 1½	by 7in.
Hame Strap (top)	5/8	by 18in.
Hame Strap (bottom)	5/8	by 15in.
Traces	... ... 1½	by 51in.

BREAST COLLAR.

Body	... ... ... 1¾	by 24in.
Lay	... ... ... 1½	by 24in.

BREAST COLLAR (continued).

Between buckles		17in.
Neck Strap 1	by 27in.
(Reduced at points to 5/8).		

Tugs 5/8	by 4in.
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SADDLE.

Girth 1¾	by 16in.
" Lay ¾	by 6in.
" Strap ¾	by 15in.
Backband 1½	by 72in.
Backband, middle	30in.
" point	... ...	16in.
Shaft Tugs, cut	... 1½	by 21in.
" " between holes		10½in.
" " linings		10½in.

CRUPPER.

Crupper Body, cut	1¼	by 18in.
" Split	5/8	by 6½in.
" Lay	¾	by 11in.
Crupper Strap	... ¾	by 36in.

BREECHING.

Breeching Seat	... 1½	by 28in.
Tugs	5/8	by 4in.
Loin Straps	... 1¼	by 34in.
" Split		12in.
Shaft Straps	... ¾	by 24in.

Donkey Harness (*continued*).

KICKING STRAP.		REINS.	
Kicking Strap for two wheeler ...	$\frac{7}{8}$ by 52in	Drafts ...	$\frac{3}{4}$ by 66in.
Kicking Strap for four wheeler ...	$\frac{7}{8}$ by 60in.	Hand-parts ...	$\frac{3}{4}$ by 54in.
Kicking Strap Tugs	$\frac{7}{8}$ by 12in.	Billets ...	$\frac{3}{4}$ by 11in.

DONKEY CART SADDLE AND BREECHING.

Bellyband, made up ...	... 1 $\frac{1}{4}$ by 36in.
Strap, made up ...	... 1 $\frac{1}{4}$ by 21in.
," and Strap attached by short sidestring to tree.	
Back Girth (nailed on hind corner of tree to go round back part of body),	45in. long.
Strap for same, 17in. long.	
Breeching Body, made up, about ...	1 $\frac{1}{2}$ by 36in.
Crupper , , ,	... 1 $\frac{1}{2}$ by 14in.
Loose loin and hip-straps, made up, about	$\frac{7}{8}$ by 26in.
Tugs for same, made up, about ...	$\frac{7}{8}$ by 5in.

FULL-SIZE GOAT HARNESS.**BRIDLE.**

Winkers D pattern, 2 $\frac{3}{8}$ in. deep, 3in. wide. Head $\frac{5}{8}$ in. wide, 13in. long. Cheeks, made cart bridle style, $\frac{5}{8}$ in. wide, 5 $\frac{1}{2}$ in. long. Ring or dee at bottom—spaces left 1in. from ring for nosepiece to slide through. Front, throat and point as cart bridle, cut in one piece, $\frac{5}{8}$ in. by 22in. Noseband, to slide through cheeks, $\frac{5}{8}$ in. by 15in.

BREAST COLLAR AND TRACES.

Body, 1 $\frac{1}{2}$ in. by 20in. ; Lay, 1in. by 18in. ; between buckles, 13in. Neck-strap buckles inserted just behind trace buckles. Neck-strap, $\frac{5}{8}$ in. by 16in. Traces (single leather), 1in. by 36in.

PAD LEATHER AND CRUPPER.

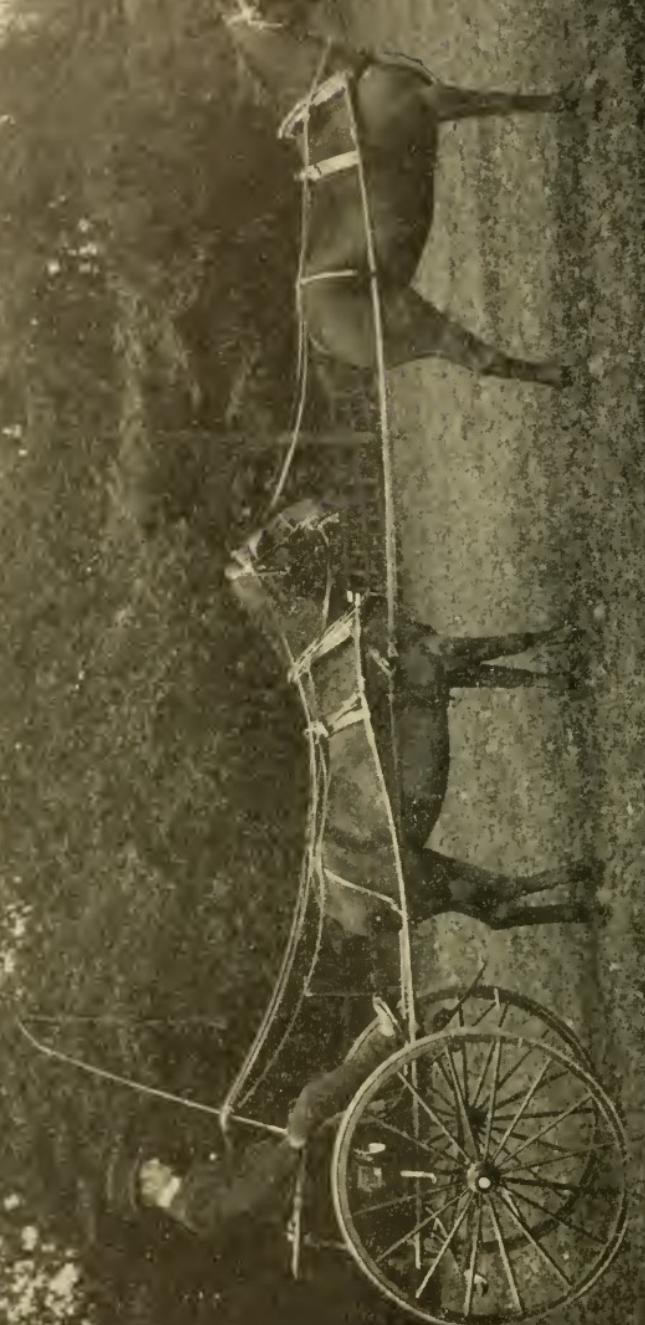
Leather cut 2in. by 22in. Two 1 $\frac{1}{8}$ in. dees stitched on for reins, and one 3in. dee for crupper strap. Backband slides under loops holding rein dees. Girth, 1 $\frac{1}{2}$ in. by 14in. Strap, $\frac{3}{4}$ in. by 10in. Backband, 1in. by 45in. Tugs (single leather) cut, 1in. by 12in., spliced 4in. long, with buckle in centre. Crupper body, 1in. by 10in., split 4in. Strap and lay in one, $\frac{5}{8}$ in. by 28in. Hip Strap, 1 $\frac{1}{4}$ in. by 24in., split 7in.

BREECHING.

Breeching, 1in. by 18in. Tugs, $\frac{5}{8}$ in. by 3in. Back Tugs placed 3in. from rings. Breeching Straps, $\frac{5}{8}$ in. by 14in.

REINS.

Leading Rein $\frac{5}{8}$ in. by 30in., hand-loop at one end, 6in. billet at the other end. Driving Reins, $\frac{5}{8}$ in. by 13ft., full length. Billets, $\frac{5}{8}$ in. by 7in.



COLLAR FORE WALES.

	ins.	ins.					
Pony ...	4	by 10½	and twice the proposed depth of Collar				
Gig ...	4¼	by 11	"	"	"	"	"
Carriage	4½	by 11½	"	"	"	"	"
Cab ...	4½	by 11½	"	"	"	"	"
Stage ...	4¾	by 12	"	"	"	"	"
Van ...	5	by 12	"	"	"	"	"
Van (heavy)	5½	by 13	"	"	"	"	"
Cart ...	6	by 13	"	"	"	"	"

When possible to cut cart forewales wider they are decidedly better for sewing on the afterwales.

RIDING BRIDLES.**SNAFFLE.**

	Full Size. Inches.	Cob Size. Inches.	Pony Size. Inches.
Head, cut	1¾ by 42	1¼ by 40	1 by 38
" split, near side	¾ by ½ by 8	¾ by ½ by 7½	¾ by ¾ by 7
" off side	¾ by ½ by 24	¾ by ½ by 23	¾ by ¾ by 22
" length between points	26	24½	23
Cheeks, to sew on, cut...	¾ by 15	¾ by 14	¾ by 13
" made up	11	10	9
" billeted, cut	¾ by 11½	¾ by 10½	¾ by 9½
" between buckles	9	8	7
" billets	¾ by 8	¾ by 8	¾ by 7½
Reins	1½ by 50	1 by 48	¾ by 46
" billets	1½ by 8	1 by 8	¾ by 7½
Front, cut	¾ by 19½	¾ by 18½	¾ by 17
" made up	14	13	12

PELHAM.

	Full Size. Inches.	Cob Size. Inches.	Pony Size. Inches.
Head, cut	1¾ by 42	1¼ by 40	1 by 38
" split, near side	¾ by ½ by 8	¾ by ½ by 7½	¾ by ¾ by 7
" off side	¾ by ½ by 24	¾ by ½ by 23	¾ by ¾ by 22
" length between points	26	24½	23
Cheeks, to sew on, cut...	¾ by 15	¾ by 14	¾ by 13
" made up	11	10	9
" billeted, cut	¾ by 11½	¾ by 10½	¾ by 9½
" between buckles	9	8	7
" billets	¾ by 8	¾ by 8	¾ by 7½
Reins	1 by 52	¾ by 50	¾ by 48
"	¾ by 48	¾ by 46	¾ by 44
" billets	8	8	7½
Front, cut	¾ by 19½	¾ by 18½	¾ by 17
" made up	14	13	12

Riding Bridles (continued).**WEYMOUTH.**

	Full Size. Inches.	Cob Size. Inches.	Pony Size. Inches.
Head, cut	1 3/8 by 42	1 1/4 by 40	1 by 38
,, split, near side	7/8 by 1/2 by 8	3/4 by 1/2 by 7 1/2	5/8 by 3/8 by 7
,, off side	7/8 by 1/2 by 24	3/4 by 1/2 by 23	5/8 by 3/8 by 22
,, length between points	26	24 1/2	23
Cheeks (3) to sew on, cut	7/8 by 15	3/4 by 14	5/8 by 13
,, made up	11	10	9
,, billeted, cut	7/8 by 11 1/2	3/4 by 10 1/2	5/8 by 9 1/2
,, between buckles	9	8	7
,, billets	7/8 by 8	3/4 by 8	5/8 by 7 1/2
Sliding head	7/8 by 32	3/4 by 30	5/8 by 28
Reins	1 by 52	7/8 by 50	3/4 by 48
,, billets	7/8 by 48	3/4 by 46	5/8 by 44
Front, cut	7/8 by 19 1/2	3/4 by 18 1/2	5/8 by 17
,, made up	14	13	12

STEEPLECHASE BRIDLES, Etc.

Head, cut	1 3/8 by 42in.	... 1 1/4 by 42in.
,, split, near side	7/8 by 7 1/2in.	... 3/4 by 7 1/2in.
,, off side	7/8 by 24in.	... 3/4 by 24in.
,, length between points	26in.	... 26in.
Cheeks, to sew on, cut	7/8 by 13in.	... 3/4 by 13in.
,, made up	7/8 by 9in.	... 3/4 by 9in.
Front, cut	7/8 by 19 1/2in.	... 3/4 by 19 1/2in.
,, made up	14in.	... 14in.
Reins, cut	1 by 58in.	... 7/8 by 58in.
,, made up	1 by 54in.	... 7/8 by 54in.

The reason for cheeks being shorter than in the case of ordinary snaffle bridles is on account of large ring bits being used; while it is always desirable in making bridles for the above purpose to give a good length of rein, exceeding rather than being under the above measurements.

When ordinary snaffle bridles are being fitted with large ring bits the cheeks should be made proportionately shorter.

NOSEBANDS FOR RIDING BRIDLES.

In addition to the narrow, stitched nosebands (which are passed through the openings left specially for the purpose), others of a different and sometimes broader kind are frequently used, and therefore a few particulars about some of them will help to make this section of the Guide more complete.

Nosebands for Riding Bridles (continued).

NOSEBAND made on $\frac{7}{8}$ in. Spiked Rings.

Front part made up 13in. long, $\frac{7}{8}$ in. in centre, reduced to $\frac{5}{8}$ in. at each end. Raised and sewn.

Buckle part on near-side, made up ...	$\frac{5}{8}$ by 3in.
Strap part on off-side	$\frac{5}{8}$ by 10 $\frac{1}{2}$ in.
Head-strap	$\frac{5}{8}$ by 32in.
," buckle side	$\frac{5}{8}$ by 9in.

Broad Nosebands 28in. long by any width from 1 $\frac{1}{4}$ in. to 1 $\frac{3}{4}$ in. Left broad for centre of the nose and tapered for point and buckle-end similar to a harness bridle noseband. Some prefer the head-strap and cheek sewn in; others to loop round the noseband so that the latter slides tightly through them. In both cases the head-strap should be made to allow about the same length as in the one mentioned above. In some cases these are left broad at the back, the strap-end only being reduced to receive buckle, which is fixed on by a small chape, the back of noseband thus serving as a guard or safe.

SHOW BRIDLES.

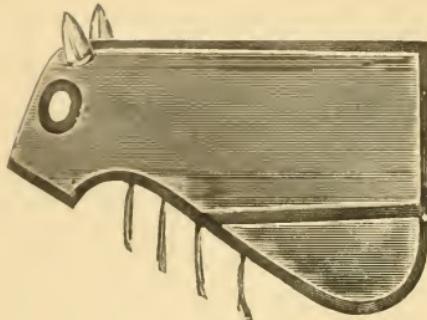
Cob.	Gig.	Carthorse.
Inches.	Inches.	Inches.
Head, cut 2 $\frac{1}{4}$ by 22	2 $\frac{1}{2}$ by 24	2 $\frac{3}{4}$ by 30
," split $\frac{3}{4}$ by 6	$\frac{7}{8}$ by 7	1 by 9
Cheeks, to pattern, cut 2 by 12	2 $\frac{1}{8}$ by 14	2 $\frac{1}{4}$ by 16
," between buckles... 7	8 $\frac{1}{2}$	10
," billets $\frac{3}{4}$ by 8	$\frac{7}{8}$ by 9	1 by 10
Front, between 1 by 12	1 $\frac{1}{8}$ by 13	1 $\frac{1}{4}$ by 14 $\frac{1}{2}$
Throat, made up $\frac{3}{4}$ by 18	$\frac{7}{8}$ by 19	1 by 21
Nose, cut 1 $\frac{1}{4}$ by 28	1 $\frac{1}{2}$ by 30	1 $\frac{3}{4}$ by 34
," swelled middle to pattern 11 $\frac{1}{2}$	12 $\frac{1}{2}$	15
," point $\frac{3}{4}$ by 6	$\frac{7}{8}$ by 6	1 by 7
Bearing Rein (off side)... 1 by 66	1 $\frac{1}{8}$ by 72	1 $\frac{1}{4}$ by 84
," " (near side) 1 bv 16	1 $\frac{1}{8}$ by 18	1 $\frac{1}{4}$ by 22
," " (billets) ... 1 by 8	1 $\frac{1}{8}$ by 9	1 $\frac{1}{4}$ by 10
Leading rein up to 16ft. long 1	1 $\frac{1}{8}$	1 $\frac{1}{4}$

NOSE BAGS.

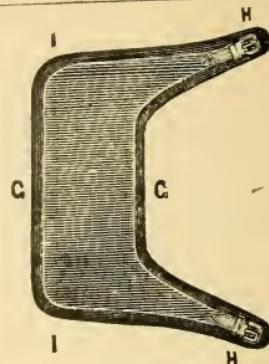
Pony.	Cob.	Full Size.	Cart Horse.
16 by 18in. ... 17 by 19in. ... 18 by 20in. ... 19 by 22in.			

LOIN COVERS.

Pony.	Cob.	Thill.	Trace.
24 by 30in. ... 30 by 36in. ... 36 by 48in. ... 48 by 54in.			
Straps $\frac{3}{4}$ by 22in. ... $\frac{7}{8}$ by 24in. ... 1 by 24in. ... 1 by 24in.			

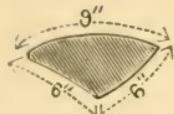


Hood.

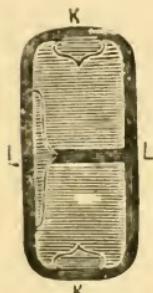


Breast Cloth.

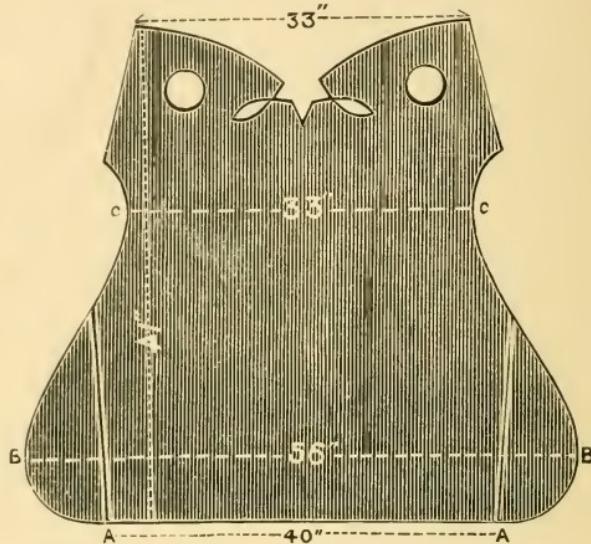
G to G 18 in. I to I 36 in.
H,, H 44,, I,, H 29,,



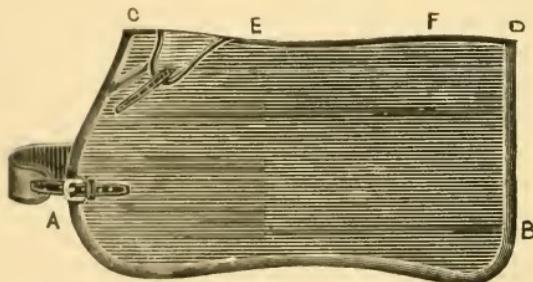
Pattern of Ears.



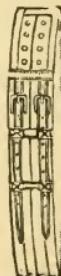
Pad Cloth.
K to K 25 in.
L,, L 13 in.



Pattern of Hood.



Quarter Cloth, with Breast Girth.
A to B 47 in. E to bottom 33 in.
C,, D 41,, F,, " 35,,
C,, bottom 35,, D,, " 34,,



Body Roller.

PATTERNS FOR A COMPLETE SUIT OF HORSE CLOTHING.

KNEE APRONS.

For one Person. For two Persons (ordinary size). Extra large.
 48 by 50in. ... 48 by 60in. ... 48 by 72in.

STRAPS FOR KNEE APRONS.

Made up $\frac{5}{8}$ in. or $\frac{3}{4}$ in. by 42in.
 One each loop back and front, and one loose loop.

HORSE CLOTHING.**ROLLERS.**

	Full Size. Inches.	Cob Size. Inches.	Pony Size. Inches.
Web	... 5 by 78	4 $\frac{1}{2}$ by 72	4 by 66
Pad	... 18	16	14
Straps	... 1 $\frac{1}{4}$ by 18	1 $\frac{1}{8}$ by 16	1 by 14
,, placed from ends	10	9	8
Facings	... 2 by 20	1 $\frac{1}{8}$ by 18	1 $\frac{3}{4}$ by 16
Cross pieces	... 2 by 5	1 $\frac{1}{8}$ by 4 $\frac{1}{2}$	1 $\frac{3}{4}$ by 4
Long loop	... 1 $\frac{1}{4}$ by 5 $\frac{1}{4}$	1 $\frac{1}{8}$ by 4 $\frac{3}{4}$	1 by 4 $\frac{1}{4}$

KNEE CAPS.

	Full Size. Inches.	Cob Size. Inches.	Pony Size. Inches.
Kersey, to pattern	... 10 $\frac{1}{2}$ by 9	9 $\frac{1}{2}$ by 8	8 $\frac{1}{2}$ by 7
Leather blocks (oval)	... 5 by 6	4 $\frac{3}{4}$ by 5 $\frac{3}{8}$	4 $\frac{1}{2}$ by 5 $\frac{1}{4}$
Strap & front in one, cut	1 $\frac{1}{4}$ by 20	1 $\frac{1}{8}$ by 18	1 by 16
Reduced for strap to	... $\frac{5}{8}$ by 9	$\frac{5}{8}$ by 8	$\frac{1}{2}$ by 7
Bottom straps	... $\frac{1}{2}$ by 12	$\frac{1}{2}$ by 11	$\frac{3}{8}$ by 10

HEAD COLLARS.**ALBERT.**

	Full Size. Inches.	Cob Size. Inches.	Pony Size. Inches.
Head, cut	1 $\frac{1}{4}$ by 28	1 $\frac{1}{8}$ by 25 $\frac{1}{2}$	1 by 23
,, made up	1 $\frac{1}{4}$ by 25	1 $\frac{1}{8}$ by 23 $\frac{1}{2}$	1 by 21
Nose, cut	1 $\frac{1}{4}$ by 21	1 $\frac{1}{8}$ by 20	1 by 19
,, made up	1 $\frac{1}{4}$ by 16	1 $\frac{1}{8}$ by 15	1 by 14
Front, cut	1 by 21	$\frac{7}{8}$ by 20	$\frac{3}{4}$ by 19
,, made up	15	14	13
Throat, cut	1 $\frac{1}{8}$ by 21 $\frac{1}{2}$	1 by 20	1 by 19
,, made up	15 $\frac{1}{2}$	14	13
,, rounded	11	10	9
Cheeks (solid) cut	1 $\frac{1}{4}$ by 14	1 $\frac{1}{8}$ by 12 $\frac{1}{2}$	1 by 11
,, made up	8 $\frac{1}{2}$	7	6
Back Stay, cut	1 $\frac{1}{4}$ by 15	1 $\frac{1}{8}$ by 13	1 by 11
,, made up	6 $\frac{1}{2}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$
Side pieces (lined) cut	1 $\frac{1}{4}$ by 12	1 $\frac{1}{8}$ by 11	1 by 10
,, made up	5	4 $\frac{1}{2}$	4
Buckle part, cut	1 $\frac{1}{4}$ by 7 $\frac{1}{2}$	1 $\frac{1}{8}$ by 7 $\frac{1}{2}$	1 by 6 $\frac{1}{2}$
,, made up	3	3	2 $\frac{1}{2}$

Head Collars (*continued*).

NEWMARKET.

	Full Size. Inches.	Cob Size. Inches.	Pony Size. Inches.
Head, cut ...	1 1/4 by 36	1 1/8 by 33	1 by 30
" made up ...	33	30	27 1/2
Nose, cut ...	1 1/4 by 21	1 1/8 by 20	1 by 19
" made up ...	16	15	14
Front, cut ...	1 by 21	7/8 by 20	3/4 by 19
" made up ...	15	14	13
Throat, cut ...	1 1/8 by 21 1/2	1 by 20	1 by 19
" made up ...	15 1/2	14	13
Cheek (near side only) cut	1 1/4 by 14	1 1/8 by 12 1/2	1 by 11
ditto made up	8 1/2	7	6
Back Stay, cut ...	1 1/4 by 15	1 1/8 by 13	1 by 11
" made up ...	6 1/2	5 1/2	4 1/2
Joul pieces, cut ...	1 1/4 by 12	1 1/4 by 11	1 by 10
" made up ...	5	4 1/2	4

When these are required with long chalbands they should be made up about the following lengths, etc. :—

Full Size.	Cob Size.	Pony Size.
3/4 by 45in.	3/4 by 39in.	5/8 by 33in.
Head Collar Rein	... ... ...	1 1/4 by 54in.
" "	billet ...	1 1/4 by 11in.
Pillar Rein	... ... ...	7/8 by 42in.
" "	billet ...	7/8 by 10in.

BREAKING CAVESON.

Head	... ... ...	... ...	1 1/2 by 27in.
" split	... ... ...	... ...	1 by 1/2 by 8in.
Buckle piece on head	... ... ...	... ...	3/4 by 6in.
Throat	... ... ...	... ...	1/2 by 19in.
Face Strap, leading from centre of nose to head, cut	... ... ...	... ...	1 1/4 by 28in.
Face Strap, leading from centre of nose to head, made up	... ... ...	... ...	23in.
Face Strap, leading from centre, reduced at point to	... ... ...	... ...	3/4 by 10in.
Front, cut	... ... ...	... ...	1 by 21 1/2in.
" between	... ... ...	... ...	12in.
Lay under centre of front to form slide for face strap	... ... ...	... ...	1 by 4in.
Cheeks, cut	... ... ...	... ...	1 by 13in.
" made up	... ... ...	... ...	1 by 8 1/2in.
Front part of nosepiece (padded)	... ... ...	1 5/8	by 18 1/2in.
Noseband (off side strap) made up	... ... ...	7/8	by 14in.
" (near side) made up	... ... ...	7/8	by 4 1/2in.
Small straps for fastening padded part to nose iron	... ...	1/2	by 4 1/2in.
Lunging Rein	... ... ...	1 1/4	by 144in.

DUMB JOCKEY.

Reins	... ... ...	$\frac{7}{8}$ in.	by	54in.
„ billets	... ... ...	$\frac{7}{8}$ in.	by	21in.
Crupper, body	... ... ...	$1\frac{3}{4}$ in.	by	24in.
„ split each end	... ...			8in.
„ billets (2)	... ...	$\frac{7}{8}$ in.	by	48in.

Dock made to buckle.

SIZES OF SOLID LEATHER DOG COLLARS.**COLLIE DOGS.**

Width.	Length.	Width.	Length.	Rounded.
$\frac{1}{2}$ in.	... 11in.	12in.	13in.	9in.
$\frac{5}{8}$ in.	... 13in.	14in.	15in.	10in.
$\frac{3}{4}$ in.	... 14in.	15in.	16in.	11in.
$\frac{7}{8}$ in.	... 15in.	16in.	18in.	12in.
1in.	... 17in.	18in.	19in.	14in.
$1\frac{1}{8}$ in.	... 19in.	20in.	21in.	
$1\frac{1}{4}$ in.	... 21in.	22in.	23in.	
$1\frac{3}{8}$ in.	... 22in.	23in.	24in.	
$1\frac{1}{2}$ in.	... 23in.	24in.	25in.	
$1\frac{3}{4}$ in.	... 24in.	26in.	28in.	
2in.	... 26in.	28in.	30in.	

GREYHOUND COLLARS.

Broad part about 2in. by 19in.

Two each narrow buckles and straps sewn on, or as lays throughout.

On cutting 2in. by 19in., leave full width for 12in. taper to 1in. for strap, sew dee on with lay in front of the buckle, passing strap through dee before buckling on the neck.

WHIPPET COLLARS.

Broad part $1\frac{1}{2}$ in. or $1\frac{5}{8}$ in. by about 13in.

Light loop sewn underneath at one end for opposite end to pass through before buckling by the short strap, which is sewn on; or continuation lay and strap as in the case of Greyhound Collars.

SIZES OF RUG STRAPS.

Width.	Length.
$\frac{1}{2}$ in.	18in.
$\frac{5}{8}$ in.	30in.
$\frac{3}{4}$ in.	—
$\frac{7}{8}$ in.	—
1in.	—
	21in.
	36in.
	42in.
	48in.
	54in.
	60in.

GLADSTONE BAG STRAPS.

Size of Bag	16in.	18in.	20in.	22in.	24in.	26in.
Size of Straps ... 1in. by	45in.	48in.	51in.	54in.	57in.	60in.

STIRRUP LEATHERS.

1½in.	48in.
1¼in.	54in.
1¾in. 54in., 57in., & 60in.	

GIRTHS.

Width of Web	2½in.	2¾in.	3in.	3¼in.
Made up—Pony	36in.	39in.	—	—
," —Cob	—	42in.	44in.	—
," —Full size	—	—	45in.	48in.

ROPE REINS.

Shaft Horse, rope cut ... ...	... 28ft.
Two " " "	... 48ft.
Three " " "	... 68ft.
(Pin horse billets sewn on ring to slide on rope).	
Four-Horse (in double-shafted waggon), rope cut 54ft.	
Billets, cut 1in. by about 16½in.	

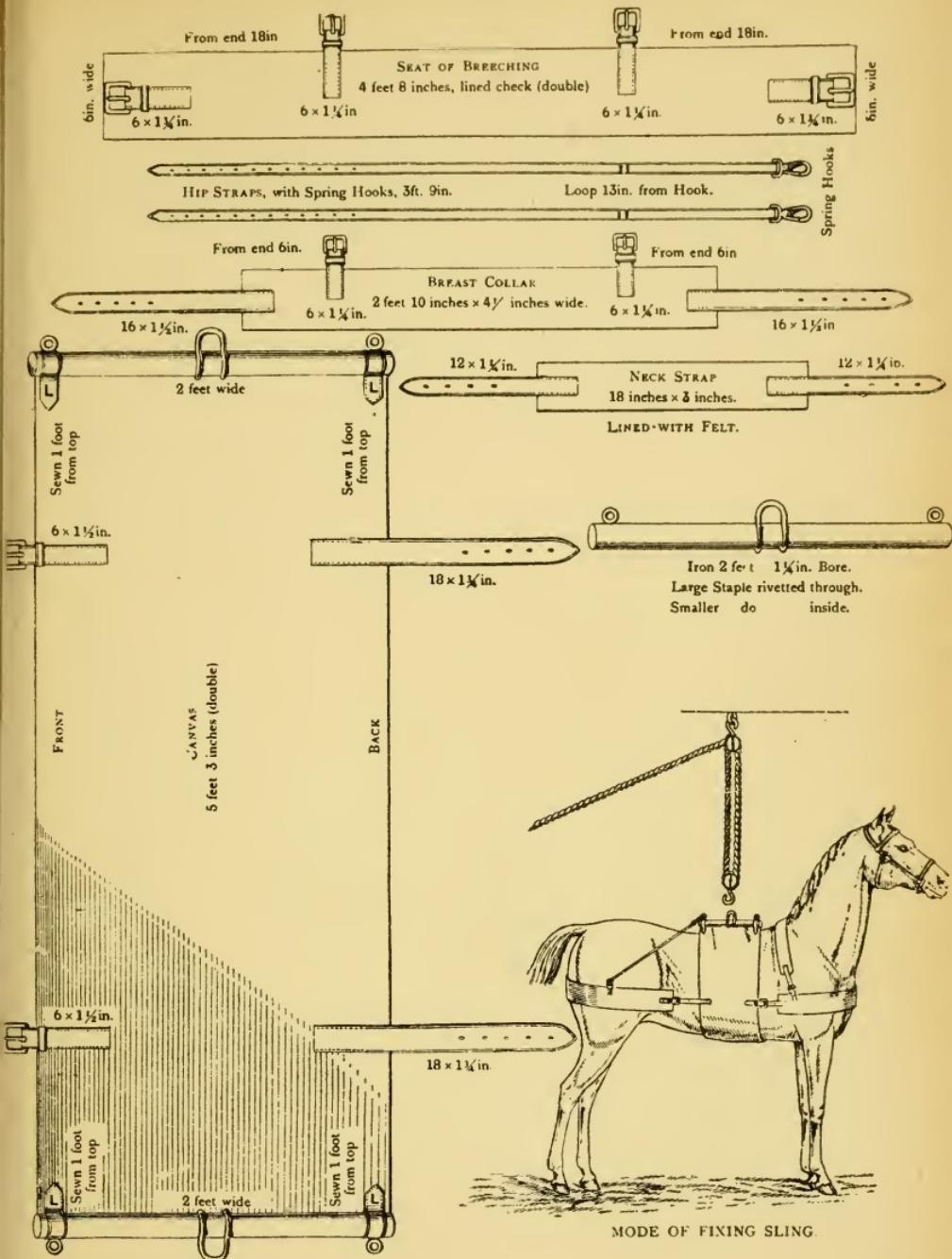
FOAL SLIPS.

CART HORSE FOALS.

Head-strap	1 by 40in.
Nose	1 by 27in.
Cheeks	1 by 10in.
Head and nose crossed in ring.	
Cheeks apart on head	15in.
," nose	11in.
'Hand-leather sewn on ring about 9in.	

DITTO FOR NAG FOALS.

Head-strap	7/8 by 36in.
Nose	7/8 by 25in.
Cheeks	7/8 by 8in.
To cross as in above slip.	
Cheeks apart on head	12in.
," nose	9in.
'Hand-leather sewn on ring about 8in.	



SLING FOR SICK HORSE.

CRUPPERS FOR RIDING SADDLES.

	Horse Size.	Cob Size.	Pony Size.
Body, cut	... ... $1\frac{1}{4}$ by 16	$1\frac{1}{4}$ by 14	$1\frac{1}{8}$ by 12in.
„ made up	... $14\frac{1}{2}$	$12\frac{1}{2}$	11in.
„ split	... ... 6	$5\frac{1}{2}$	5in.
Strap	... ... ... $\frac{7}{8}$ by 24	$\frac{7}{8}$ by 21	$\frac{3}{4}$ by 18in.
Dock (for rounding)	... ... ... $1\frac{1}{2}$ by 15	$1\frac{1}{2}$ by $14\frac{1}{2}$	$1\frac{3}{8}$ by 14in.

These are generally made up with one loop sewn in where strap is sewn on to body, an additional loop about 3in. further back, and a slide loop on the strap.

If required specially strong, a 1in. strap is put on the horse size, and the body made $1\frac{1}{2}$ in. wide.

Occasionally a broad piece of leather is folded for the dock instead of making them round.

TAIL CASE FOR PONY.

Depth	...	...	7in.
Width	...	...	8in.
Strap when buckled	...	...	32in.

GAG HEAD AND REIN (Riding Bridle).

Loose Head-strap	...	...	$\frac{3}{4}$ by 27in.
Cheeks, from end of rein	...	...	$\frac{3}{4}$ by 12 to 14in.
„ rounded	...	...	8in.
Reins, made up	...	...	$\frac{3}{4}$ or $\frac{7}{8}$ by 54in.

If head made like ordinary bridoon, long-side 36in.

SIDE SADDLE BALANCE GIRTH, Etc.

Loose Girth, made up	...	...	$1\frac{1}{2}$ by 42in.
Strap on off-side of saddle	...	...	1 by 17 or 18in.
Strap screwed on near-side point of tree (in slanting position)	...	...	1 by 15in.

If attached to looped stirrup leather on the near-side instead of strap on tree point, the stirrup leather is made about 1in. wide by 2ft. 6in.

Ordinary leather girth sewn on side saddle flap,
about $1\frac{1}{2}$ in. by 2ft. 6in.

Strap for same, about 1in. by 18in.

EXTRA THROATBAND FOR HARNESS BRIDLE.

(i.e., when sewn into a small ring or dee fastened in cheek near the bottom of winker).

Off-side, with buckle 13in.

Near-side Strap 6½in.

Slightly longer if sewn into the cheek without a dee.

HOPPER STRAP.

7ft. long, 1¼in. or 1½in. wide.

DONKEY BODY ROLLER.

Web ... 4ft. 3in. | Strap ... 1ft. 3in.

RACE SURCINGLE.

Web, about ... 2¼ by 57in. | Strap 1 by 24in.

BREECHES OR LEGGING STRAPS.

Made up ¼in. or ¾in. wide by 17in. or 18in. long.

COUPLING STRAPS.

FOR WAGGON OR DRAY HORSES.

Made up 1¼in. wide by 33in. and 27in.

FOR CALVES.

Made up about 1¼in. by 29in. long.

Watering Chain in the centre.

NECK COLLAR (for Tying up Beast).

About 2¼in. wide by 48in. long.

GUN STRAP (OR SLING).

Long-side made with loop sewn on the end opposite to punch holes, the latter being passed through loop when fastened on gun. 1¼in. wide by 30in.

Short-side looped in similar way, but buckle-end passed through loop before buckle and loop are sewn in to receive the long side. Made up 1¼in. by 15in.

RIDING BREASTPLATE.

Neck-strap, cut	...	...	...	$\frac{7}{8}$	by	$28\frac{1}{2}$ in.
Made up (from bend to bend)	...					23in.
Crestpiece, cut	...	...	...	$1\frac{3}{8}$	by	14in.
			(Tapered to)	$\frac{7}{8}$ in.)		
Made up (from bend to bend)	...					9in.
Wither-straps, cut	...	...	...	$\frac{5}{8}$	by 26 to 29in.	
Made up	...	...	...			24 to 27in.
Bottom (or girth part), cut	$1\frac{3}{8}$ in.	wide by	46in.	(tapered to 1in.		
Made up (from ring to bend when buckled),	36in.					

MACHINE BELTING.

The usual lengths of joints and number of lines of sewing in each case :—

Width of Belt.	LENGTH OF JOINTS.		LINES OF SEWING.	
	Single.	Double.	Single.	Double.
1in.	3in.	—	2 lines.	—
$1\frac{1}{4}$ in.	3in.	—	2 „	—
$1\frac{1}{2}$ in.	$3\frac{1}{2}$ in.	—	2 „	—
$1\frac{3}{4}$ in.	$3\frac{3}{4}$ in.	—	2 „	—
2in.	4in.	3in.	2 „	2 lines.
$2\frac{1}{4}$ in.	$4\frac{1}{4}$ in.	3in.	2 „	2 „
$2\frac{1}{2}$ in.	$4\frac{1}{4}$ in.	3in.	3 „	2 „
$2\frac{3}{4}$ in.	$4\frac{1}{4}$ in.	3in.	3 „	2 „
3in.	$4\frac{1}{2}$ in.	$3\frac{1}{4}$ in.	3 „	3 „
$3\frac{1}{4}$ in.	$4\frac{1}{2}$ in.	$3\frac{1}{4}$ in.	3 „	3 „
$3\frac{1}{2}$ in.	$4\frac{1}{2}$ in.	$3\frac{1}{2}$ in.	3 „	3 „
4in.	$4\frac{3}{4}$ in.	$3\frac{3}{4}$ in.	4 „	3 „
$4\frac{1}{2}$ in.	$4\frac{3}{4}$ in.	$3\frac{3}{4}$ in.	4 „	4 „
5in.	5in.	4in.	4 „	4 „
$5\frac{1}{2}$ in.	$5\frac{1}{4}$ in.	$4\frac{1}{4}$ in.	4 „	4 „
6in.	$5\frac{1}{2}$ in.	$4\frac{1}{2}$ in.	4 „	4 „
$6\frac{1}{2}$ in.	6in.	5in.	4 „	4 „
7in.	$6\frac{1}{2}$ in.	$5\frac{1}{2}$ in.	5 „	5 „
$7\frac{1}{2}$ in.	7in.	6in.	5 „	5 „
8in.	$7\frac{1}{2}$ in.	$6\frac{1}{2}$ in.	5 „	5 „
9in.	8in.	7in.	6 „	6 „
10in.	$8\frac{1}{2}$ in.	$7\frac{1}{2}$ in.	6 „	6 „
11in.	9in.	8in.	6 „	6 „
12in.	10in.	$8\frac{1}{2}$ in.	6 ..	6 ..

The length of joints allowed is for stout ends. For shoulder, and light ends of strips the joints must be proportionately longer to produce an even substance throughout the belt.

Machine Belting (*continued.*)

BEST QUALITY MACHINE BELTING : Its average weight per 100 feet, and price per foot :—

Width.	PRICE PER FOOT.		WEIGHT PER 100 FEET.	
	Single.	Double.	Single.	Double.
	s. d.	s. d.		
1in.	0 4	—	... 6½lbs.	... —
1¼in.	0 5½	—	... 8lbs.	... —
1½in.	0 7	—	... 11lbs.	... —
1¾in.	0 8	—	... 14lbs.	... —
2in.	0 9	1 9	... 16lbs.	... 26½lbs.
2¼in.	0 10	2 0	... 18lbs.	... 30lbs.
2½in.	1 0	2 2	... 22lbs.	... 36lbs.
2¾in.	1 2	2 4	... 25lbs.	... 41lbs.
3in.	1 3½	2 7	... 28lbs.	... 46lbs.
3½in.	1 6½	3 2	... 33lbs.	... 55lbs.
4in.	1 10	3 7	... 39lbs.	... 65lbs.
4½in.	2 1	4 1	... 45lbs.	... 74lbs.
5in.	2 5	4 6	... 52lbs.	... 86lbs.
5½in.	2 7	4 10	... 56lbs.	... 93lbs.
6in.	2 9	5 4	... 60lbs.	... 100lbs.
6½in.	3 0	6 0	... 64lbs.	... 106lbs.
7in.	3 4	6 6	... 68lbs.	... 112lbs.
7½in.	3 8	7 2	... 72lbs.	... 120lbs.
8in.	4 0	7 10	... 76lbs.	... 127lbs.
9in.	4 7	8 11	... 94lbs.	... 156lbs.
10in.	5 2	10 0	... 104lbs.	... 172lbs.
11in.	5 9	11 6	... 114lbs.	... 190lbs.
12in.	6 6	12 7	... 124lbs.	... 206lbs.

ESTIMATE SHEET No. 1.

SET OF BEST THILL HARNESS, WITH BRASS FURNITURE.

Particulars.	BRIDLE.	Ozs.		
			s.	d.
1¼in. × 24in.	Head ...	...	5	
2in. × 15in.	Nosepiece (lined)	...	8	
1½in. × 48in.	Front, Throat and Point	...	11	
1½in. × 54in.	Off-side Rein	...	13	
1½in. × 26in.	Near-side Rein	...	7	
¾in. × 24in.	Cheek Straps (2)	...	6	
1in. × 78in.	Check Rein and Billet	...	12	
¾in. × 9in.	Facepiece Strap	...	3	
1¼in. × 13in.	Cheeks and Brace Pieces	...	10	
6¾in. × 6¾in.	Winker Linings	...	12	
Leather @ 2/- per lb.	5lbs. 7ozs.	10	10	½
6¾in. × 6¾in.	Patent Leather Winkers @ 2/8, 8ozs.	...	1	4
Brass.	One Pair Rosettes	...	0	5
"	Two S. Hooks	...	0	4
"	Two Scallop 2¼in., fluted	...	0	6½
"	Four 1½in. Buxton Buckles	...	0	8
"	One 1in.	...	0	1½
"	Three ¾in. whole Buxton Buckles	...	0	4½
"	Four 1¾in. Rings	...	0	8
"	Two ⅞in. Dees for Cheeks	...	0	2
"	One Flyer	...	0	7½
"	One Jointed Noseplate	...	0	6½
"	One Facepiece	...	0	3½
With swivel.	One Galvanized Check Rein Chain	...	0	9
Winkers sewn 9 to inch, other parts 8.	Hemp, Wax, etc.	...	0	6
	Labour, 13 hours @ 6d.	...	6	6
		£1	4	8½

(Leather 12/2½, Furniture 5/6, Sundries 6d., Labour 6/6.)

REINS.				
1½in. × 30ft.	3¾lbs. Leather @ 2/-	...	7	6
	Two 1½in. Brass Buxton Buckles	...	0	3
	Labour, 1½ hours @ 6d.	...	0	9
			8	6
HAMES.				
32in.	Best Solid Brass (—) Brand	...	15	3
1¼in. × 26in.	Hame Strap, 6ozs. Leather @ 2/-	...	0	9
	One 1¼in. Buxton Buckle	...	0	2
	Making Hame Strap	...	0	2
			16	4

Estimate Sheet No. 1 (*continued.*)

Particulars.		s. d.
23½in.	Collar (bought)	10 0
1½in. × 17in.	Collar Straps, 10ozs. Leather @ 2/- ...	1 3
12in. × 22in.	Housing Patent Leather, 1lb. 8ozs. Leather @ 2/8	4 0
1in. × 9in.	Housing Straps (2), 3ozs. Leather @ 2/8 Two 1in. Housing Buckles	0 6
	Two Fluted Scallops 2½in.	0 8½
	Labour, 4 hours @ 6d.	2 0
		18 7½

(Collar 10/-, Leather 5/9, Furniture 10½d., Labour 2/-.)

SADDLE

18in. × 24in.	Patent Leather for Housing, 3lbs. @ 2/8	8 0
	Linings for Housing, 1lb. @ 1/6	1 6
1½in. wide.	Girth and Strap, 1lb 8ozs. @ 2/-	3 0
"	Meter Buckle Pieces, 8ozs. @ 2/-	1 0
"	Crupper Loop, 4ozs. @ 2/-	0 6
"	One 12in. Tree	1 4
"	One 12in. Pad (bought)	3 6
Brass.	One Pair Galvanized Australian Irons...	0 10
"	One Pair ¾in. Beads	1 1
"	One Pair Rings and Clips	1 0
"	Four 2¾in. Fluted Scallops @ 5/3	1 9
"	One Pair of Ridger Bars...	1 0
"	Three 1½in. Buxton Buckles	0 6
	Four Tie Strings for Pad	0 4
	Hemp and Wax	0 4
Top sewn 9 to inch,	Making, 12 hours @ 6d. ...	6 0
other parts 8.		
		£1 11 8

(Leather 14/-, Tree 1/4, Pad 3/6, Furniture 6/2, Sundries 8d., Labour 6/-.)

MARTINGALE.

1½in. wide.	Girth,	lb. Leather @ 2/-	... ...	2 0
¾in. wide.	Ring Straps,			
Brass.	Linings for Facepieces, ½lb. Leather @ 1/4 ...	...	...	0 8
"	Four Facepieces @ 3/6	...	...	1 2
"	One 1¾in. Ring	...	...	0 2
"	One 1½in. Buxton Buckle	...	...	0 2
"	Two ¾in. whole Buxton Buckles	...	...	0 4
	Labour, 1½ hours @ 6d....	...	...	0 9
				5 3

(Leather 2/8, Furniture 1/10, Labour 9d.)

Estimate Sheet No. 1 (*continued*).

Particulars.	BREECHING AND CRUPPER	s.	d.
3in. × 72in.	{ Seat and Lay, bs. Leather @ 2/- ...	8	0
2½in. × 70in.	Loin Strap, 10ozs. Leather @ 2/- ...	1	3
1¼in. × 50in.	Hip Straps, 12ozs. Leather @ 2/- ...	1	6
1¼in. × 27in.	Tugs (4), 1lb. Leather @ 2/- ...	2	0
3½in. × 20in.	Crupper Body, 12ozs. Leather @ 2/- ...	1	6
2½in. wide.	Lay and Billet, 1lb. 4ozs. Leather @ 2/- ...	2	6
	One 2½in. Brass Buxton Buckle ...	0	5
	Four 1¼in. " " "	0	8
	Two 2½in. Brass on Iron Dees... ...	0	8½
Sewing 8 to inch.	One Pair 3½in. Galvanized Contract Breeching Irons	2	1
	Labour, 16 hours @ 6d.	8	0
	Hemp, Wax, etc....	0	8
		£1	9 3½

(Leather 16/9, Furniture 3/10½, Sundries 8d., Labour 8/-.)

WANTEY, WITH TWO BILLETS.

Stout single leather.	Body, 3½in. wide by 36in. long .		
	Billets, 3½in. wide by 30in. long.		
Brass.	3½lbs. of Leather @ 2/-... ...	7	0
	Two 3½in. Buxton Buckles	1	7
	Labour, 1½ hours @ 6d.	0	9
	Hemp and Wax	0	2
		9	6

TOTAL.

Bridle	...	...	...	1	4	8½
Reins	...	...	...	0	8	6
Hames and Strap	...	...	...	0	16	4
Collar, Housing, etc.	...	...	...	0	18	7½
Saddle	...	...	...	1	11	8
Martingale	...	...	...	0	5	3
Breeching and Crupper	...	...	...	1	9	3½
Wantey	...	...	...	0	9	6
				£7	3	10½

This shows the prime cost of harness. Trade profit differs with each locality, so that no attempt will be made to add this in any of the estimates. In taking the cost of leather at 2s. per lb., and labour at 6d. per hour, this has been done for simplicity in working out each item. Where these do not correspond with the prices paid, the difference must be allowed for.

ESTIMATE SHEET No. 2.

PLAIN MEDIUM QUALITY BRASS THILL HARNESS—NO
WANTEY, REINS, CHECK REIN, OR MARTINGALE.

Particulars.	BRIDLE	lbs.	ozs.	
1½in. × 24in.	Head	...	...	4½
1½in. × 48in.	Throat, Front and Point	...	...	9½
1½in. × 54in.	Off-side Rein	...	...	12
1½in. × 24in.	Near-side Rein	...	...	6½
1½in. × 15in.	Nosepiece	...	...	4
1½in. × 13in.	Cheeks	...	...	9
6¾in. × 7¼in.	Winkers and Brace Pieces	...	1 1	
" "	Winker Linings	...	...	12
				s. d.
	Leather @ 1/8	...	4 10½	7 9
Brass.				
	Four 1½in. Buxton Buckles	...	...	0 8
	Four 1¾in. Rings	...	...	0 8
	Two S. Hooks	...	...	0 4
Sewing 8 to inch all parts.	Labour, 9 hours @ 6d.	...	...	4 6
	Hemp, Wax, etc.	...	...	0 5
				14 4

(Leather 7/9, Furniture 1/8, Sundries 5d., Labour 4/6.)

HAMES.

32in.	¾ Brass Cased with Japanned Tackle	11	0
1¼in. × 26in.	Hame Strap, 5ozs. @ 1/9	0	5½
	One 1¼in. Buxton Buckle	0	2
	Making Hame Strap	0	2
		11	9½

COLLAR AND HOUSING.

24in.	Collar (bought)	...	...	10 0
1½in. × 16in.	Collar Straps, 9ozs. Leather @ 1/9	...	...	1 0
Circular.	Housing, 14ozs. Leather @ 1/9	...	...	1 7
	Labour, 3 hours @ 6d.	...	...	1 6
	Hemp, Wax, and Thongs	...	...	0 4
				14 5

SADDLE.

18in. × 24in.	Housing, 3lbs. Leather @ 1/9	...	5 3
1½in. wide.	Binding, ½lb. Leather @ 1/9..	0	10½
"	Girth & Strap, 1lb. 6oz., Leather @ 1/9	2	4½
	Meter Buckle Pieces, 8oz. Leather @ 1/9	0	10½
	Crupper Loop, 4ozs. Leather @ 1/9	0	5½
	One 12in. Tree	...	1 4
	Carried forward	...	11 2



Estimate Sheet No. 2 (*continued.*)

Particulars.	Brought forward ...	s.	d.
One 12in. Pad (bought) ...	...	11	2
One Pair $\frac{7}{8}$ in. Beads ...	...	2	9
Rings and Screws... ...	...	1	1
Three 1 $\frac{1}{2}$ in. Buxton Buckles ...	...	0	10
Four Tie Strings for Pad ...	...	0	6
Hemp and Wax ...	...	0	4
All parts sewn 8 to inch.	Labour, 10 hours @ 6d. ...	5	0
		£1	1 11

(Leather 9/10, Tree 1/4, Pad 2/9, Furniture 2/5, Sundries 7d., Labour 5/-.)

BREECHING AND CRUPPER.

$3\frac{1}{2}$ in. \times 60in.	{ Seat and Lay, $3\frac{3}{4}$ lbs. of Leather @ 1/9	6	7
$2\frac{1}{2}$ in. \times 58in.	Loin Strap, 10ozs. Leather @ 1/9	1	1
$1\frac{1}{2}$ in. \times 48in.	Hip Straps, 12ozs. Leather @ 1/9	1	4
$1\frac{1}{2}$ in. \times 26in.	Tugs (4), 12ozs. Leather @ 1/9	1	4
No safes.	Crupper Body, 10ozs. Leather @ 1/9	1	1
$3\frac{1}{2}$ in. \times 24in.	Lay and Billet, 1lb. 2ozs. Leather @ 1/9	1	11 $\frac{1}{2}$
$2\frac{1}{2}$ in. wide.	One $2\frac{1}{2}$ in. Brass Buxton Buckle	0	5
Sewing 8 to inch.	Four $1\frac{1}{2}$ in. , , , "	0	8
	Two $2\frac{1}{2}$ in. Brass Dees ...	0	8 $\frac{1}{2}$
	One Pair $3\frac{1}{2}$ in. Japanned Breeching Irons	1	3
	Labour, 15 hours @ 6d. ...	7	6
	Hemp, Wax, etc. ...	0	8
		£1	4 7

(Leather 13/4 $\frac{1}{2}$, Furniture 3/0 $\frac{1}{2}$, Sundries 8d., Labour 7/6.)

TOTAL.

Bridle ...	...	0	14	4
Hames and Strap ...	...	0	11	9 $\frac{1}{2}$
Collar and Housing ...	...	0	14	5
Saddle ...	...	1	1	11
Breeching and Crupper ...	...	1	4	7
		£4	7	0 $\frac{1}{2}$

ESTIMATE SHEET No. 3.

SET OF PLAIN PONY HARNESS, BRASS FURNITURE,
NO BEARING REIN.

Particulars.	BRIDLE.	Ozs.	
1¾in. × 20in.	Head	4	
1¾in. × 25in.	Nosepiece (lined centre only) ...	5	
5/8in. × 25in.	Cheeks	5½	
5/8in. × 16in.	Throat	1½	
1in. × 11in.	Winker Stay	1½	
	Winker Linings	3	
		—	s. d
	Leather @ 1/8	1lb. 4½ozs.	2 2
	Patent Leather for Winkers, 4ozs. @ 2/-		0 6
	Fancy Patent Leather Front ...		0 10
	Pair Winker Plates ...		0 3½
Brass.	Pair Rosettes ...		0 4
"	½-doz. 5/8in. Wire Buckles ...		0 4
	One Common Pony Wilson Bit ...		0 4½
	Labour		3 6
	Hemp, etc.		0 3
		—	8 7

(Leather 3/6, Furniture 1/0½, Sundries 6½d., Labour 3/6.)

REINS.

3/4in. × 20ft.	Drafts and Billets, 14ozs. @ 2/- ...	...	1 9
3/4in. × 54in.	Handparts (brown) ...	...	1 3
	Two 3/4in. Buckles ...	...	0 2
	Making, etc. ...	...	0 8
		—	3 10

COLLAR, HAMES, & TRACES.

18in.	Plain Leather Collar ...	...	7 0
	Pair All-over Ring Draft Hames ...	...	3 6
	Hame Strap, 6ozs. @ 1/8... ...	...	0 7½
	Two 5/8in. Buckles ...	...	0 1½
1¾in. × 54in. Polished.	Traces, 1lb. 10ozs. Leather @ 1/8 ...	...	2 8½
Sewn 7 to in., 4 rows.	Pair Chain Ends ...	...	0 7
	Making Traces and Hame Strap ...	...	4 6
	Hemp and Wax ...	...	0 6
		—	19 6½

SADDLE.

4in.	Plain Flap Saddle, with Screw Skirts ...	12	6
	Pair Plain Wire Terrets ...	0	7½
	Plain Knob ...	0	3
	Girth, Strap & Lay, 10oz. Leather @ 1/8	1	0½
	7/8in. Roller Buckle ...	0	1½
	Carried forward ...	14	6½

Estimate Sheet No. 3 (*continued.*)

		s. d.
	Brought forward ...	14 6½
Making and Sewing on Girth and Strap		0 9
Hemp and Wax ...	...	0 1
		<hr/> 15 4½

BACKBAND AND TUGS.

Particulars.		lbs. ozs.
1¼in. × 81in. 1¼in. wide.	Backband ...	1 6
	Tugs ...	10
		<hr/>
	Leather @ 1/8 per lb.	2 0
	Two 1¼in. Tug Buckles...	0 7½
	Pair Tug Loops (brass) ...	0 3
	One 1¼in. Roller Buckle	0 2
	Making Backband	3 6
Sewn 4 rows, 7 to inch.	Making Tugs ...	2 3
	Hemp and Wax ...	0 0
		<hr/> 10 7½

(Leather 3/4, Furniture 1/0½, Sundries 6d., Labour 5/9.)

BREECHING AND CRUPPER.

1¼in. & 5/8in. 7/8in. 1¼in. 1¼in. & 7/8in.	Breeching Seat and 4 Tugs...	10 oz.
	Shaft Straps ...	5 "
	Split Hip Strap ...	7 "
	Crupper Body, Lay and Strap	8 "
		<hr/>
	Leather @ 1/8 per lb.	1lb. 14ozs. 3 1½
	Four 5/8in. Buckles	0 3
	Three 7/8in. Buckles	0 3
	Two 1½in. Rings	0 2½
Sewn 9, once round.	Making Breeching Seat and Tugs	2 6
	Plain Hip Strap ...	0 4
	Crupper ...	0 7
	Making Breeching Straps	0 6
	Hemp and Wax ...	0 3
	Paper Dock ...	0 8
		<hr/> 8 8

(Leather 3/1½, Furniture 8½d., Sundries 11d., Labour 3/11.)

TOTAL.

Bridle ...	...	...	...	...	8 7
Reins ...	...	...	...	...	3 10
Collar, Hames and Traces	...	...	...	19	6½
Saddle ...	...	...	...	15	4½
Backband and Tugs ...	...	...	...	10	7½
Breeching and Crupper	...	...	...	8	8
					<hr/> £3 6 7½

ESTIMATE SHEET No. 4.

SET OF PLAIN, BRASS-MOUNTED TRADESMEN'S
HARNESS (Full Size).

3/4in. Strapping and Bridle. 1 1/2in. Traces and Backband.

	BRIDLE.					s. d.
2 1/4lbs. of Leather @ 1/9 per lb.	3 11 1/2
Patent Leather, 6oz. @ 2/8 per lb.	1 0
Pair Winker Plates	0 4
" Rosettes	0 6
Chain Front	0 7 1/2
Pair Plain Swivels	0 4 1/2
Twelve 3/4in. Buckles	0 9
Two 3/4in. Rings	0 1
One Flat Ring Wilson Bit	1 6
Making Bridle: Winkers and front sewn 12, noseband 10, other parts 8 to inch	6 6
						15 7 1/2

(Leather 4/11 1/2, Furniture 2/4, Sundries 1/10, Labour 6/6.)

REINS, 1in. x 24ft.

Drafts and Billets, 1 1/4lbs. @ 1/9	...	...	...	...	...	2 2 1/2
Pair 1in. Handparts	...	...	...	...	...	1 10
Pair 1in. Buckles	...	...	...	...	...	0 2 1/2
Making	...	...	...	...	...	1 0
						5 3

COLLAR.

22in. Plain Stage Collar	9 6
--------------------------	-----	-----	-----	-----	-----	-----

HAMES, HAME STRAPS, AND TRACES.

Pair 23in. All-over Brass Ring Draft Hames	...	...	...	...	...	4 3
Traces, 1 1/2in. x 5ft., Leather 3 1/4lbs. @ 1/9	...	...	...	...	...	5 8 1/2
Hame Straps, Leather 1/4lb. @ 1/9	...	...	...	...	...	0 5 1/2
Two 3/4in. Buckles	...	...	...	...	...	0 1 1/2
Pair Galvanised Trace Chains	...	...	...	...	...	0 9
Making Traces, Sewn 4 rows	...	...	...	...	...	6 0
Making Hame Straps	...	...	...	...	...	0 4
						17 7 1/2

(Leather 6/2, Furniture 5/1 1/2, Labour 6/4.)

Estimate Sheet No. 4 (*continued.*)

SADDLE.

					s.	d.
6in. Plain Solid Leather Cab Saddle	...	...	...	...	15	0
Girth, Strap and Lay, 14oz. Leather @ 1/9	...	...	...	...	1	6½
One 1½in. Roller Buckle	...	...	...	...	0	2½
One Pair Plain Terrets	...	...	...	...	1	1
One Plain Knob	...	...	...	...	0	4
Making Girth, Strap and sewing on to Saddle	...	...	...	...	1	0
					19	2

BACKBAND, 1½in. × 8ft.

2lbs. 6oz. leather @ 1/9	...	...	...	...	4	2
Shaft Tugs, 13oz. Leather @ 1/9	...	...	...	...	1	4
One 1½in. Roller Buckle	...	...	...	...	0	3½
Pair 1½in. Tug Buckles	...	...	...	...	0	11
Pair 1½in. Tug Loops	...	...	...	...	0	4½
Making Backband, sewn 8	...	...	...	...	3	6
Making Tugs, sewn 8	...	...	...	...	2	6
					13	1

(Leather 5/6, Furniture 1/7, Labour 6/-.)

CRUPPER.

Body 1½in., Strap and Lay 1½in. wide, 13oz. of Leather @ 1/9	...	...	...	...	1	4
One 1½in. Buckle	...	...	...	...	0	1½
Dock (paper)	...	...	...	...	0	8
Making Crupper	...	...	...	...	1	4
					3	5½

BREECHING.

Seat 1½in. × 42in., 14oz. Leather @ 1/9	...	...	...	...	1	7
Four Tugs, 6oz. Leather @ 1/9	...	...	...	...	0	8
Four ¾in. Buckles	...	...	...	...	0	3
Two 1¾in. Rings	...	...	...	...	0	4½
Making Breeching, sewn 9, Tugs 8	...	...	...	...	3	9
					6	7½

(Leather 2/3, Furniture 7½d., Labour 3/9.)

SHAFT STRAPS.

Shaft Straps 1½ × 30in., 12oz. Leather @ 1/9	...	...	...	...	1	4
Two 1¼in. Buckles	...	...	...	...	0	4
Making	...	...	...	...	0	6
					2	2

ESTIMATE SHEET No. 5.

**SET OF LINED GIG HARNESS, WITH SILVER-PLATED
FURNITURE.—MEDIUM QUALITY.**

$\frac{3}{4}$ in. Bridle; $1\frac{1}{2}$ in. Traces, Backband and Tugs; $1\frac{3}{8}$ in. Breeching; 1in. Crupper and Shaft Straps. Ordinary Bearing Rein to Bridle.

MAKING.						
Winkers, sewn 14 to inch	...	...	...	...	...	2 6
Cheeks sewn 12 to inch	...	...	...	...	...	2 6
Head, with Lay, sewn 13 to inch	...	...	...	...	...	1 0
Face Piece sewn 14 to inch	...	...	...	...	...	1 4
Noseband sewn 13 to inch	...	...	...	...	...	2 8
Front sewn 14 to inch	...	...	...	...	...	1 8
Winker Strap sewn 13 to inch	...	...	...	...	...	1 2
Bearing Rein, with grooved roundings	...	...	...	...	...	2 3

(Leather 6/4½, Furniture 9/10, Bit, etc., 4/4, Labour 15/1.)

COLLAR.

23in. Patent Leather Collar 12 6

HAMES.

All-over Hames, with Finger Draft and Ball Dees	16	0
Shoulder Tugs, 1lb. Leather @ 2/4	2	4
Hame Straps, $\frac{1}{4}$ lb. Leather @ 2/4	0	7
One Pair 1 $\frac{1}{2}$ in. Buckles	2	3
Two $\frac{3}{4}$ in. Buckles	0	6 $\frac{1}{2}$
Making Tugs (no savers) sewn 11 to inch, and rivetting to Hames	4	0
Making Hame Straps	0	6

TRACES, 1½in. x 5ft. 10in.

3 3/4 lbs. Leather @ 2/4	...	...	...	...	...	8 9
Making, sewn 11 to inch	...	...	...	...	...	10 3
						<hr/>
						19 0

Estimate Sheet No. 5 (*continued.*)

	SADDLE.					s. d.
6in. Patent, Lined Flap	19 0
Pair Ball Terrets	5 0
Hook	1 6
One 1in. Roller Buckle	0 6½
Girth, Short Lay and Strap, 1¼lbs. Leather @ 2/4	2 11
Patent Leather Patch Piece...	0 2
Making Girth, sewn 10	1 0
Making Strap, sewn 12 once round	1 0
Sewing on Girth and Strap	0 8
						<u>£1 11 9½</u>

(Leather 3/1, Saddle 19/-, Furniture 7/0½, Labour 2/8.)

BACKBAND, 1½in. × 8ft. 3in

2¼lbs. Leather @ 2/4	...	...	...	...	...	5 3
One 1½in. Roller Buckle	...	...	...	...	...	0 9
Making, sewn 11, four rows in centre	...	...	...	...	...	6 0
						<u>12 0</u>

SHAFT TUGS.

1lb. Leather @ 2/4	...	...	...	...	...	2 4
One Pair Tug Buckles	...	...	...	...	...	2 3
Making, sewn 9 to inch	...	...	...	...	...	4 0
						<u>8 7</u>

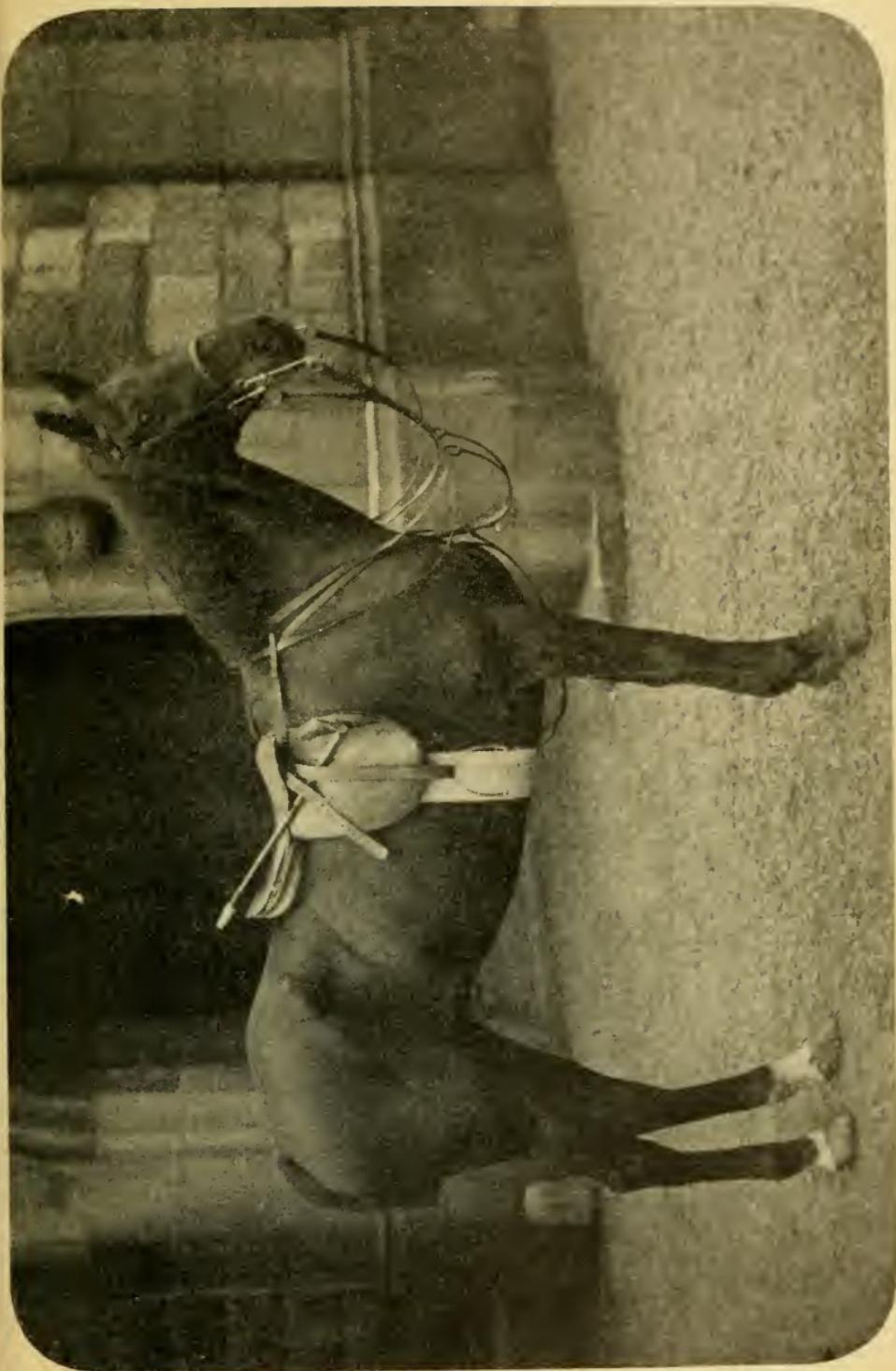
CRUPPER.

1lb. Leather @ 2/4	...	...	...	...	...	2 4
One 1in. Buckle	...	...	...	...	...	0 4½
Linseed Dock	...	...	...	...	...	1 6
Making Crupper, sewn once round 13 to inch	...	...	...	...	...	5 0
						<u>9 2½</u>

BREECHING

1¼lbs. Leather @ 2/4	...	...	...	...	...	2 11
Two 1¾in. Rings	...	...	...	...	...	1 10
Two ¾in. Dees	...	...	...	...	...	0 7
Four ¾in. Buckles @ 3/3	...	...	...	...	...	1 1
Making body, sewn 12 to inch once round, with oval	...	...	...	...	...	2 8
Making four tugs sewn 10 to inch	...	...	...	...	...	2 2
						<u>11 3</u>

(Leather 2/11, Furniture 3/6, Labour 4/10.)



Estimate Sheet No. 5 (*continued.*)

SHAFT STRAPS.

s. d.

$\frac{3}{4}$ lb. Leather @ 2/4	...	...	...	...	...	...	1	9
Two 1in. Buckles @ 4/6	...	...	...	...	...	...	0	9
Making, sewn 12 to inch once round	...	...	...	...	...	...	3	6
							6	0

HIP STRAP.

$\frac{3}{4}$ lb. Leather @ 2/4	...	...	...	...	...	...	1	9
Making, sewn once round, 13 to inch	...	...	...	...	...	...	5	0
							6	9

REINS, 1in. × 25ft.

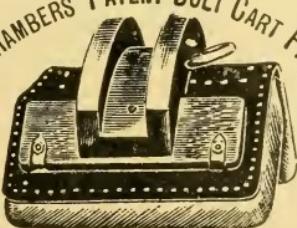
Drafts and Billets, 1½lbs. Leather @ 2/4	...	...	...	...	...	...	3	6
Pair of 1in. Handparts	...	...	...	...	...	...	2	2
Making	...	...	...	...	...	...	1	2
							6	10

TOTAL.

s. d.

Bridle	...	...	...	...	...	1	15	7½
Collar	...	...	...	...	...	0	12	6
Hames, Hame Tugs, and Hame Straps	...	...	...	...	...	1	6	2½
Traces	...	...	...	...	...	0	19	0
Saddle	...	...	...	...	...	1	11	9½
Backband	...	...	...	...	...	0	12	0
Shaft Tugs	...	...	...	...	...	0	8	7
Crupper	...	...	...	...	...	0	9	2½
Breeching	...	...	...	...	...	0	11	3
Shaft Straps	...	...	...	...	...	0	6	0
Hip Strap	...	...	...	...	...	0	6	9
Reins	...	...	...	...	...	0	6	10
Hemp, Wax, etc.	...	...	...	...	...	0	3	6

£9 9 3



CHAMBERS' PATENT BOLT CART PAD.

Fitted and
Removed
in 5 minutes.

H. C.
CHAMBERS

Cart Pad
Manufacturer,

BEST IN THE MARKET.

BURES, SUFFOLK, R.S.O.

ESTIMATE SHEET No. 6.

THE SAME HARNESS AS No. 5, WITH KICKING STRAP
IN PLACE OF BREECHING. FOR TWO WHEELER.

KICKING STRAP, 1½in. × 5ft. 3in.						s.	d.
1lb. of Leather @ 2/4	...	...	...	...	...	2	4
	TUGS, 1½in. × 14in.						
½lb. Leather @ 2/4	...	...	...	...	...	1	2
Two 1½in. K.S. Buckles	...	...	...	...	...	1	8
Making Kicking Strap, sewn once round	13					3	4
Making Tugs, sewn 12 to inch	...	...	...	...	...	2	6
Hemp, Wax, etc.	...	...	...	...	...	0	6
						11	6
Cost of Harness No. 5	...	...	...	...	...	9	9
DEDUCT :—						3	
Breeching	...	...	...	...	11	3	
Shaft Straps	...	...	...	...	6	0	
Hip Strap	...	...	...	...	6	9	
Hemp and Wax	...	...	...	...	0	9	
					1	4	9
					8	4	6
Add Cost of Kicking Strap and Tugs	...	...	...	...	11	6	
Cost of Kicking Strap Harness	...	...	...	...	£8	16	0

ESTIMATE SHEET No. 7.

THE SAME HARNESS AS No. 5, WITH LONG BREECHING
IN PLACE OF SHORT BREECHING. FOR FOUR
WHEELER.

BREECHING, 1½in. points to 1½in. centre, 11ft. 6in. long.
Leather, 2½lbs. @ 2/4 5 10

KICKING STRAP, 1½in. × 6ft. 3in.							
1lb. 2ozs. Leather @ 2/4	...	...	...	...	...	2	7½
Tugs, ½lb. Leather @ 2/4	...	...	...	...	...	1	2
Two 1½in. Kicking Strap Buckles	...	...	...	...	...	1	8
Two Loops	...	...	...	...	...	2	0
Two 1½in. Breeching End Buckles	...	...	...	...	...	1	0
Making Long Breeching, sewn once round	13	to	inch	..	..	7	1½
" Kicking Strap, sewn once round,	13	to	inch	..	..	3	9
" " Tugs, sewn 12 to inch	...	...	...	..	..	2	6
Hemp and Wax	...	...	...	...	...	0	10
Cost of Long Breeching	...	...	...	...	...	£1	8
Cost of Harness No. 5	...	...	...	...	...	9	9
DEDUCT :— Ordinary Breeching, etc.	...	...	...	...	...	1	4
						9	5
Add Cost of Long Breeching, etc.	...	...	...	...	...	1	8
Cost of Harness with Long Breeching	...	...	...	...	...	£9	13
						0	

ESTIMATE SHEET No. 8.

THE SAME HARNESS AS No. 5, WITH TILBURY BACK-BAND IN PLACE OF ORDINARY BACKBAND.

TILBURY BACKBAND, 1½in. x 8ft.						s.	d.
2½lbs. Leather @ 2/4	...	...	...	...	...	5	3
BELLYBAND, 1½in. x 2ft. 4in.							
3½lbs. Leather @ 2/4	...	...	...	...	...	1	9
Leather for covering Tugs (no savers), 5ozs. @ 2/4	...					0	9
Pair 1½in. Tilbury Tugs	...	...	...	...	...	9	6
Two 1½in. Bellyband Buckles @ 10d.	...	...	...	...	...	1	8
Making Backband, sewn 11 to inch, 4 rows centre only...	...					7	6
Making Bellyband, sewn once round 11	...	...	...	...	...	2	3
Covering Tugs	...	...	...	...	...	2	0
 Cost of Tilbury Backband						£1	10
Cost of Harness No. 5	...	...	...	...	...	9	9
DEDUCT :—Backband 12/-, Shaft Tugs 8/7	...					1	0
 Add Cost of Tilbury Backband and Tugs						8	8
Cost of Harness, with Tilbury Backband and Tugs	£9	19	4				

ESTIMATE SHEET No. 9.

THE SAME HARNESS AS No. 5, WITH FRENCH BACK-BAND IN PLACE OF ORDINARY BACKBAND.

BACKBAND CENTRE, 1½in. x 3ft. 6in.						
1lb. 2ozs. Leather @ 2/4	...	...	...	...	..	2 7½
POINTS, 1½in. x 1ft. 9in.						
14ozs. Leather @ 2/4	...	...	...	...	...	2 0½
BELLYBAND, 1½in. x 2ft. 4in.						
¾lbs. Leather @ 2/4	...	...	..	..	..	1 9
5ozs. Leather for covering Tugs @ 2/4	...	...	..	..	..	0 9
Making Backband, centre sewn 4 rows, 11 to inch						3 0
Making Points, sewn once round, 11 to inch						2 9
Covering Tugs (no savers)	...	...	..	..	..	2 0
Pair of 1½in. French Tugs	...	...	..	..	1	0 0
Two 1½in. Roller Buckles	...	...	..	..	..	1 8
Cost of French Backband						£1 16 7
Cost of Harness No. 5	...	...	..	..	..	9 9 3
DEDUCT :—Backband 12/-, Shaft Tugs 8/7						1 0 7
						8 8 8
Add Cost of French Backband and Tugs	...	...	..	..	..	1 16 7
Cost of Harness with French Backband	...	...	..	..	..	£10 5 3

SUPPLEMENTARY ESTIMATES.

VAN BACKBAND 1 $\frac{3}{4}$ in. × 9ft. ; Middle, 3ft. 9in. ; Strap, 1ft. 9in.	s. d.
3 $\frac{1}{2}$ lbs. Leather @ 2/-	... ... ... ... ... 7 0
1 $\frac{3}{4}$ in. Brass Swage Roller Buckle	... ... ... ... 0 5
Making, sewn 8 to inch, middle 4 rows	... ... ... 4 6
Hemp and Wax	... ... ... ... 0 6
	<u>12 5</u>

COB BACKBAND, 1 $\frac{3}{8}$ in. × 7ft. 6in. ; Middle 3ft. 3in. ; Point 18in.	
Leather, 1lb. 14ozs. @ 2/-	... ... ... ... ... 3 9
1 $\frac{3}{8}$ in. Brass Wire Roller Buckle	... ... ... ... 0 3 $\frac{1}{2}$
Making, sewn 10 to inch, 4 rows in middle	... ... ... 5 0
Hemp and Wax	... ... ... ... 0 4 $\frac{1}{2}$
	<u>9 5</u>

NEW MIDDLE TO BACKBAND, 1 $\frac{1}{2}$ in. × 3ft. 6in., sewn 10 to inch, 4 rows.	
Leather, 1lb. 2ozs. @ 2/-	... ... ... ... ... 2 3
Labour	... ... ... ... ... 3 3
Hemp and Wax	... ... ... ... ... 0 4
	<u>5 10</u>

NEW PAIR OF POINTS TO TRACES, each 1 $\frac{1}{2}$ in. × 17in., sewn 11 to inch, 4 rows.	
1lb. Leather @ 2/-	... ... ... ... ... 2 0
Labour	... ... ... ... ... 3 0
Hemp and Wax	... ... ... ... ... 0 4
	<u>5 4</u>

3in. TIE WANTEY, 12ft. long, Double Part 7ft.	
Leather, 4lbs. @ 2/-	... ... ... ... ... 8 0
Galvanised Chain Hook, 1lb. 6ozs. @ 5d. lb.	... ... ... ... 0 7
Making, sewn 8 to inch, 3 rows	... ... ... ... 3 6
Hemp and Wax	... ... ... ... 0 4
	<u>12 5</u>

4in. LEATHER BODY ROLLER, 6ft. 6in. long.	
2 $\frac{3}{4}$ lbs. Leather @ 2/8	... ... ... ... ... 7 4
Two Straps, 1 $\frac{1}{4}$ in. × 18in. ; Two Chapes and four Loops— $\frac{3}{4}$ lb. @ 2/8	... ... ... ... ... 2 0
Facings and Cross Pieces from Calf Roundings, 6ozs. @ 1/4	0 6
Serge and Doe Hair	... ... ... ... 0 6
Two 1 $\frac{1}{4}$ in. Tinned Buckles	... ... ... ... 0 2
Making, hand-sewn throughout	... ... ... ... 4 6
Flax, etc.	... ... ... ... 0 3
	<u>15 3</u>

Supplementary Estimates (*continued.*)**MAKING 60ft. × 3in. MACHINE BELTING (single).**

					£	s.	d.
Leather, 31lbs. @ 1/6	...	...	...	...	2	6	6
Sewing 14 joints, 4 to inch, 3 rows, @ 3d.	...	...	...	...	3	6	
Hemp and Wax	...	...	...	...	1	0	
Cutting, Preparing and Finishing Belt, 3½ hours @ 8d.	...	...	...	...	2	4	
Rivets and Washers	...	...	...	...	0	4	
					<hr/>		
					£2	13	8

**MAKING 30ft. × 6in. DOUBLE LEATHER BELTING,
SEWN HELVETIA LACES.**

32lbs. Leather @ 1/6	...	..	..	...	2	8	0
5 doz. ¼in. × 3ft. Helvetia Laces @ 1/7	...	...	...	...	7	11	
Sewing	...	...	...	...	7	6	
Cutting, Preparing and Finishing, 6 hours @ 8d.	...	...	...	...	4	0	
Rivets and Washers	...	...	...	...	1	0	
					<hr/>		
					£3	8	5

To accurately gauge the cost of New Harness
or Repairs, use should be made of . . .

"THE ESTIMATE AND COST BOOK,"

published at the office of "Saddlery and Harness,"

Walsall. Price 1/- post free.

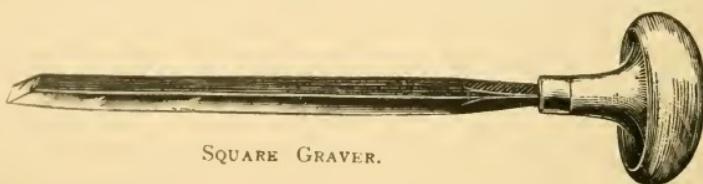
ENGRAVING AND MONOGRAM CUTTING.

At the outset of this article it may be stated that skilful penmanship is an absolutely indispensable qualification to anyone who intends acquiring a practical knowledge of the art of engraving. It is useless to start cutting letters in metal before they can be well drawn on paper.

The primary difficulty which faces the beginner, who purposes teaching himself, is the selection of tools. The writer, when starting, had no proper tools, but upon finding this out, the advice of an assistant in a London tool warehouse was solicited, and with the tools afterwards obtained by his advice, and from personal observations of different kinds of engraving, good progress was made. Dog collars, watches, and other articles were engraved in a fairly good though amateurish style, but the best results not being quite satisfactory, arrangements were made to spend a week as improver in a London engraving shop, and it was there that the proper way to do the work was learnt. A correct method and all sorts of "wrinkles" were learnt in that one week, and it was to that contact with the professional engraver that the great improvement made was due.

Metal engraving may be divided into three branches: (1) Copper (and steel) plate engraving for printing purposes, in which the letters and words have all to be cut to read backwards; (2) Ordinary engraving, such as dog collar plates, whips, watches, and other articles; and (3) Brass plate engraving, such as name plates for doors and shop fronts, and "brasses" for cart harness, etc., when not cast in. The plainer sort of work included in No. 2 only is dealt with here. Possessing, in addition to the ability to shape letters above referred to, the virtues of patience and perseverance, without which it is useless to think of success, our beginner may purchase the necessary tools. These may consist of three square and six lozenge gravers in handles, for cutting; one dry point (an ordinary seat awl serves the purpose excellently) for marking; one pair dividers, like small compasses; one lens, like the magnifying glass used by watchmakers; and one oilstone for sharpening gravers, etc. He must also procure or make himself a sand-bag, *i.e.*, a leather case just like a flat Dutch cheese, about 6in. in diameter, stuffed full of sand to lay the work upon, and a "fiddle," *i.e.*, a piece of wood about 12in. by 1in., with a piece of buff leather glued half the length (like a straight crest brush, with buff leather instead of bristles) to polish the metal after the cutting is finished. All

SIDE VIEW.



SQUARE GRAVER.

the above-mentioned tools will cost from 7s. to 10s., and make a complete outfit for the present. Three of the lozenge gravers

must be converted into flat sculpters, and are much better to use than flat sculpters proper, which, however, may be bought instead

SIDE VIEW.



LOZENGE GRAVER.

if preferred. The conversion of a lozenge graver to a flat sculpter is obtained simply by rubbing the under sharp edge down on the

FRONT VIEW.



FLAT SCULPER CONVERTED FROM GRAVER.

oilstone from about 1in. from the point to the required width. All of the gravers when purchased will probably be found too long and too hard. The graver is pushed by the handle, or haft, resting against the palm of the hand, and the blade held by the thumb and two first fingers of right hand, just like a pen. When in this position the point should not be more than about $\frac{1}{2}$ in. in front of finger tips, or control is weakened. To properly temper the gravers when too hard, they must be held in a gas jet until they get to a straw colour heat, then suddenly withdrawn and dipped in oil, not water. When made the proper length and temper, the gravers must be given a "belly" or the points will be continually breaking off in the metal worked upon, causing much annoyance and delay. This is done by rubbing down on the oilstone each under-side of

POINT OF FLAT SCULPER

PROPER.



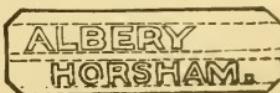
AS PURCHASED.



BELLY MADE AT POINT.

the graver at the point. The points and bellies must be rubbed on oilstone until perfectly smooth and bright, with a keen edge, or they will not cut clean, but leave a burr each side of the groove.

Having now all necessary tools properly prepared, let the beginner plant his sand-bag firmly on his counter, with a good light right in front of him. If the light is artificial he had better place a tissue paper shade between it and the pad. Place the article to be engraved—we will say a dog collar—on the pad, and with the dividers, or compasses, mark the spaces for words, and with the dry point, or seat awl, trace the letters required, thus:—



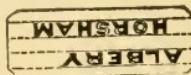
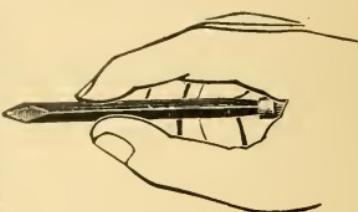
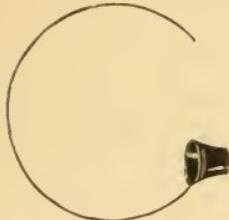
Now put the lens in the left eye, closing the right one. If it

cannot be kept in the eye, get a piece of old clock spring long enough to wind round the head, and attach it. Now take a flat sculper of the width of point required, in the right hand as directed above, and hold the dog collar with the fingers of the left hand, so that the words read away from you as shown below. First cut all the upright lines and parts of lines of letters from bottom to top with a clean cut all the way, or little by little—the writer has found the former method the better for soft metal, and the latter

for hard metal—then turn the collar round so that the words read toward you, and cut the lines already made clean to the bottom. Next turn the dog collar so that it reads upside down, and cut the parallel lines, or parts of lines of letters as shown below. Then turn the collar round so as to read the right way, and cut parallel lines, just made clean, to the end. This leaves only the round parts of the letters to do. These must be done very carefully in very small cuts, widening the outside edge as you go. Each separate cut is indicated below by the cross lines.

The flat sculper is now done with, and it only remains to finish the ends of the letters with the square graver. This is easy to do, but hard to explain. Anyone who has followed the article thus far will discover the way in a minute if he will examine any sample of engraving. The best explanation that can be here given is that the ends are cut straight across with the graver held at an angle of about 45 degrees from the right-hand corner only. The accompanying drawing deals with block, or "sans seraph," letters, whether upright or slanting.

When it is required to cut Roman letters the fine lines are made with a lozenge graver, and the seraphs, *i.e.*, fan tails, cut from each corner as directed for the ends of block letters. In what is known as round-hand lettering, the thick lines may be made either with the flat sculper or with the square graver, and the fine lines with the lozenge graver, connecting the two with the square graver. In both round-hand and Roman lettering, make the thick lines first, then the thin lines, and then connect with the square graver. Seraphs, if any, should be done last. The cutting should be so clean as not to require any "finishing." To clean off the work, put a little dry "Brillantine" or polishing powder on the "fiddle" and rub across the plate.



Sans
Seraph.



With the above few hints an intelligent, observant, and energetic young man should learn how to engrave a dog collar and similar articles fairly well. He will find the work (after the first few weeks of breaking the points off the tools and running the gravers right across the plate into his left hand), very interesting, and if he can design monograms and fancy ornamental lettering and embellishments, Roman. it will become quite a fascinating pursuit. But it is necessary, if he means to become at all skilful, to get into touch with a professional engraver, or a good amateur, and of the latter, it may be said, there are very few. In one day he could thus learn more than by a week or a month of book-reading on the subject. The letters engraved on brass cart harness plates, scallops, etc., are done quite differently. This is rougher and more laborious. The plate is fixed to a board or in a vice, the graver is punched with a hammer, and the work done in a manner identical to that of a mason cutting a tombstone.

With regard to monograms, they appear both ornamental and as indicating ownership upon well-nigh everything to-day. They are noticed upon horse rugs, carriages, whips, crops, watches, rings, books, notepaper, bicycles, brush backs, walking sticks, umbrellas, leather cases, etc., etc., and the designs for them are in endless variety. How many have been puzzled when they have had a monogram, to pick the initials of a new customer, and explain to anyone which is the first, second, third, or fourth letter. As far back as the writer can trace, the earliest monograms of modern

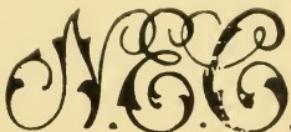
times were the marks of old merchants put upon bales of goods, as the A.F., J.T.B., and F.A.S., as shown. From these has evolved another variety of monogram, in which, as the F.A.S. shows, the letters are, as it were, hung

one upon the other, an arrangement with an old-world method that is to-day very much favoured.

As in most other things, there is fashion in monograms, and not a few amateurs ingeniously exercise their skill in forming novel arrangements for their initials. The N.E.C., which is termed a running cypher, or script, as it is here arranged, is more simple than any monogram, is easier read at a glance, and looks quite as well. The designing of a really artistic monogram, however, particularly when the combination of letters is an awkward one, is possible only to the specialist, simple as the task may appear. Just at the present time the plain block "Egyptian," or Roman, style of monogram, the simplest of its kind, is the most fashionable, the letters M.C. and D.O.L. being devoid of ornamentation. They



Round-hand.



appear, in fact, as if just carved out of a piece or block of wood. It is really marvellous to notice the different tastes that some



people have for monograms, amongst them, some of high artistic intelligence. One, for instance, will adopt a style as severe as another's is ornate and complicated, and whilst some like huge designs, the monograms of others are of infinitesimal proportions. The handles used for this work are not round, and there is nothing at the bottom of the hand to catch against the article you are engraving.

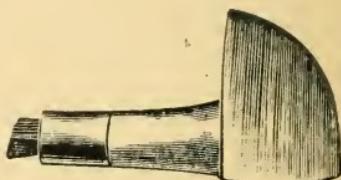
It is difficult to engrave a medallion or coin. To try and hold it seems absurd, therefore it must be a fixture. Get a small tin box, blocked and very firm; heat the lid till it will melt a piece of engraver's wax (such as is used for brass door plates, etc.), melt enough on the lid to hold the coin, and drop the latter on the wax when hot; then let it get cool. It will then be ready to operate upon, and will not be easily moved. Silver mounts, etc., are difficult to sketch on with pencil, especially where monograms are wanted, but this can be easily overcome by putting your finger on a piece of Russian tallow or hard fat, and smearing it over the surface, which may then be sketched upon without scratching it.



To try and put the reader into the way of sketching a monogram is a very difficult thing, as no two letters will go together in exactly the same way. Perhaps the plainest monograms, of which this is another variety, are "The Roman." It looks a very easy matter to sketch a monogram of this description, but it requires the most careful handling, as imperfections here show up more distinctly than in many of the more complicated varieties.

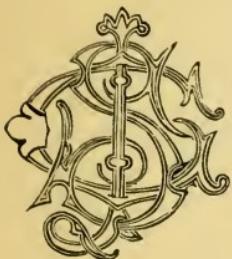
Embossed monograms for notepaper and cards which are raised upon the paper are, of course, struck up from dies which descend upon the paper when it is resting upon a bed of gutta-percha.

The time taken over a monogram, naturally enough, depends upon the size and the amount of labour to be put into it. Some monograms would take as long to sketch on the article as another would to engrave. The wholesale prices of engraving monograms, etc., are as follows:—Cypher monograms on mounts, etc., 3s. 6d. each; fancy two-letter blocks, on mounts, etc., 4s. 6d.; inscriptions on small plated articles, per dozen letters, 1s.; coats of arms, 7s. 6d. and 10s. 6d. each; double lined two-letter cyphers and monograms, by the dozen, 6s. The sizes of



STEEL MONOGRAM DIE.

monograms vary so much that whilst an ornamental cypher could probably be put on to the handle of a spoon in about ten minutes, spread over the back of a watch it might take a couple of hours. Some intricate designs, of course, take days to complete. Just below you have a capital specimen of a three-letter monogram which looks well on anything. Amongst curious monograms, a notable one was seen which consisted of the entire twenty-six letters of the alphabet, a design far too complicated to be reproduced here. Five of its letters were done in gold, six in brown, six in violet, and nine in green.



Where the same monogram is to be engraved upon a number of articles—say spoons—the first one finished is taken and rubbed over with printing ink—that is, ink used for printing newspapers or placards.

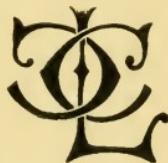
Well, after you have applied the ink to the monogram with the end of your finger and rubbed it well in, and then wiped off with a piece of damp paper (ladies' curl paper is the thing), enough ink has remained in the cuts to mark the paper, and this in turn transfers an impression to the next subject.

The monograms A.M. and J.T. are in perfect "gothic" style. It must be understood that monogram work such as is done by the best engravers only—a trade which is most difficult to learn in all its branches—is treated of now.

Here, attention may be called to the fact that—as in the design beneath—letters are sometimes reversed for the sake of appearance, when the reverse letter is not to be read, this monogram not being C.C.L., but C.L. A few years ago, great numbers of people collected monograms, just as they now do stamps, etc., and displayed them in their albums.

The writer remembers reading an article on engraving, some years ago, which stated that it takes an apprentice three years before he can properly sharpen an ordinary graver.

Besides being cut into articles, monograms cut out of gold or silver, metal-plated or gilded, are often fixed on them, these being termed "piercings," because they are pierced or cut out, and are most often done with a fret-saw (like you may have seen queen's or king's heads cut out of pennies), and afterwards carved up or ornamented by hand. Some of these are very expensive indeed, especially when ornamented with precious stones. Not everyone can correctly read even a three-letter monogram. The next one, here shown, is of course D.B.R., the D.B. being read in the ordinary way from left to right, and you know the R stands for the surname, because it is made the most important letter. Some



monograms upon harness are difficult to read, but whenever you get a letter hatched or shaded as in the accompanying cut, you may know that it is to be understood as the initial of the surname. Where there are more letters they are grouped according to the skill of the artist, not jumbled up anyhow.

 Where one letter of the three is thus made to stand out prominently, and where there is no reading from left to right, a different course is adopted. Another three-letter design is here depicted. The S is now the last letter because you see it is hatched; of the other two the O is the smaller, therefore you are informed that the reading is B.O.S. If you can think of these easy rules you will be able to make out a good many of these devices, and take more interest in any monogram of notable heads that you may meet with.

 It is a fact that there are not a few people to whom a monogram, composed of more than two letters, is as unintelligible as a time-table or directory. They may, perhaps, know what the letters in themselves are, but as to the order in which they should read them they are entirely ignorant.

COPPER-PLATE ENGRAVING AND DIE SINKING.

Inscriptions or Monograms engraved, and all classes of Copper-plate Engraving and Die Sinking undertaken by T. Kirby & Sons Limited, Walsall.

USEFUL RECIPES.

A SUITABLE CEMENT FOR JOINING THE SPLICES OF MACHINE BELTS.—Take 1lb. of best French glue, break it up and soak it in just enough water to cover for 12 hours, then pour off the unabsorbed water, and bring the glue to a liquid state by heat. The two surfaces to be joined must each receive a thin coating; they are then joined, and immediately put under a press.

CEMENT FOR JOINING LEATHER.—Soak for one day, one pound of common glue in enough water to cover, and one pound of isinglass in ale droppings, then mix together and heat gently until boiling; at this point add a little pure tannin, and keep boiling for half-an-hour. If the glue and isinglass, when mixed, be too thick, add water. This cement should be used warm, and the jointed leather pressed tightly together for 12 hours.—“Chemical Recipes.”

PASTE FOR PATENT LEATHER.—The following is a French recipe for preserving the gloss of patent leather:—Melt pure wax over a water bath, place on a moderate coal fire, add first some olive oil, then some lard, and mix intimately by stirring; next add some oil of turpentine, and finally some oil of lavender, till the resulting paste in boxes, where, on solidifying, the necessary consistency will be acquired. To restore the gloss to the leather, apply a little of the paste, and rub with a linen rag. This will keep the leather soft and prevent cracking.

PERMANENT PASTE is made by adding to each half-pint of flour paste, without alum, 15 grains of corrosive sublimate, previously rubbed to powder in a mortar, the whole to be well mixed; this, if prevented from drying by being kept in a covered pot, remains good any length of time, and is therefore convenient; but unfortunately it is extremely poisonous, though its excessively nauseous taste would prevent it being swallowed accidentally. It possesses the great advantage of not being liable to the attacks of insects.

TO JOIN LEATHER.—By adding a little vinegar to ordinary glue, any two substances, such as leather and iron, may be effectively joined.

WATERPROOF GLUE.—10 parts linoleate of manganese, 20 parts best white glue, 5 parts water, 2 parts yellow oxide of lead. Soak the glue in the water until the latter has become absorbed, then gently heat it to render it fluid; meanwhile heat the linoleate of manganese to about 400 degrees Fah., and stir it in the hot melted glue. When well incorporated, mix in the lead oxide, and, if too thick, thin with more hot linoleate of manganese. As this compound dries very quickly, it is best to use it hot and freshly prepared, as it does not readily melt when heated, owing to the oxidizing action of the lead salt on the constituents of the linoleate, whereby insoluble linoxide is formed.—“Chemical Recipes.”

A GOOD BLACK, ESPECIALLY FOR CHAMOIS SKINS.—Four ounces of ground nut galls, one pound of green nut shell (butter nut pods) are boiled in two quarts of water for one hour, and strained. Then one ounce of iron filings, half an ounce of common salt, and one quart of vinegar are mixed, allowed to stand for an hour, and added.

A GOOD WAX FOR BRIDLE AND BROWN LEATHER WORK.—1lb. of bees wax, $\frac{1}{4}$ lb. clear resin, and $\frac{1}{4}$ lb. white lead. Heat all these together in a vessel over a slow fire, and, when thoroughly melted and well mixed, pour it into a bowl of clean water, and proceed to pull it as in making ordinary wax. The more it is pulled, the more tenacious will it be found in adhering to the threads, and cementing the work together.

A POLISH FOR BELT EDGES.—For polishing the edges of machine belts, add two tablespoonfuls of melted glue to half-a-pint of water, then add a little red ochre to colour it. Apply this to the edges whilst in a hot state, and polish with a coarse cloth.

BALL BLACK FOR LEATHER STRAPS. — $\frac{1}{4}$ oz. isinglass, $\frac{1}{4}$ oz. indigo, 4oz. logwood, 2oz. soft soap, 4oz. glue softened, and 1 pint vinegar. Well mix, warm, strain, and allow it to cool.

BLACK LEATHER LACQUERS FOR CHEAP ARTICLES.—Dissolve 12oz. black pitch in 35 fluid ounces of turpentine.

BLACK VARNISH FOR LEATHER.—Rub 2oz. lamp black in 8 fl. oz. turps, and separately digest 24oz. shellac, 10oz. ven. turps, and 4oz. Sandarac resin in 192 fl. oz. methylated spirits. When these resins have dissolved, mix the turps and lamp black mixtures, and well shake the whole.

BROWN CREAM OR PASTE FOR BROWN LEATHER.—Melt some spermaceti wax in a gallipot or earthenware vessel placed in a saucepan, when fluid, stir in some olive oil and some lard. The relative quantities of these two ingredients will determine whether the compound is to be a cream or paste, more oil being used for the former, and wax if a paste is desired. When these articles are thoroughly incorporated by stirring, add some tinc. of annatto or turmeric, according to colour desired, or a little solid Bismark brown may be used as a colouring matter—a few grains is sufficient to a pound of cream. There is one advantage and one drawback in using this aniline dye, viz.: It readily seizes on leather and permanently stains it, and this prevents the leather showing a worn or shabby appearance, but it also deepens to a dark brown by frequent applications. When the colouring matter is well mixed, add some oil of turps, and finally oil of lavender as a perfume. The portions will be determined by the operator. Well stir the whole compound, and keep it simmering from 5 to 10 minutes, then ladle it out into tin boxes to congeal, if for a paste; but, if cream is desired, thin with a larger quantity of turps to the required consistency, and bottle off. To use this compo, smear a little over the leather with a sponge or linen rag, and, when well rubbed in, polish with a piece of flannel or felt.

BROWN COMPO.—20 fl. oz. good malt vinegar, 10 fl. oz. filtered water, 2oz. good glue, 1 dr. soft soap, 1 dr. isinglass, colour with annatto or turmeric. Mix the water and vinegar, and dissolve glue in the fluid by gently heating it, add colouring and the other ingredients, and boil from 10 to 15 minutes; strain the mixture, and bottle. To use this compo, lay it on with a rag or flannel.

DRESSING FOR BELTS (ADHESIVE).—5lb. tallow, 1lb. yellow wax, 2lb. common chalk, 1lb. black lead, and 1lb. resin. Dissolve these together by gentle heat. Put upon the belt when slightly warm. Be sure and keep well stirred in the kettle while applying it to the belt. Use a little at a time and frequently.

FOR RUBBING UP BROWN EDGES, make a solution of oxalic acid and add to good harness compo.

HARNESS BLACKING.—Melt 2lbs. mutton suet, 6lbs. bees' wax, when melted, stir in 6lbs. sugar candy, 2½lbs. lamp black, 2lbs. soft soap, and ½lb. indigo in powder, and when the whole has been thoroughly mixed by heating and stirring for an hour over a slow fire, add ½-gallon oil of turps.

HARNESS BLACKING POLISH.—Heat together, over a slow fire, 16oz. white wax and 24oz. turps. When the wax has dissolved, mix in 8oz. ivory black and 1oz. powdered indigo. Stir the mixture till cold. Take a little of this compound on a cloth or piece of flannel (old is best) not fluffy, and polish with a shoe brush.

HARNESS BLACKING COMPO.—1¼oz. yellow wax, ½oz. powdered indigo, ½oz. powdered extract of logwood, 1oz. powdered drco black, 7oz. spirits of turps. Melt the wax in turps over slow fire, then the other ingredients, and mix together. Keep in a vessel from which the air is excluded, and stir well before using. Apply with a sponge or soft brush, and polish with a hard brush.

HARNESS COMPO RENOVATOR.—Dissolve ½oz. isinglass, or best gelatine, and 8oz. glue in 1 quart vinegar in separate vessels. Extract the goodness from 8oz. logwood by boiling it in 1 quart vinegar, strain and dissolve in it ½oz. indigo. Mix the two compounds. Add 4oz. soft soap, and strain.

HARNESS GREASE OR SOAP.—4oz. ammonia soap, 1oz. palm oil, 3oz. ordinary hard soap (pure), and 1¾oz. of a solution of tannin, made by digesting 9 to 16oz. tannic acid in 4oz. water. Gently heat the oil and soap together until melted, using a water bath, then add the ammonia soap, and lastly the tannin solution. Well mix by constantly stirring, and put into stoneware jars. The ammonia soap is prepared by heating olive oil to the boiling point, and then stirring in sesqui-carbonate of ammonia (in powder) until the smell of ammonia that is given off remains permanent in the compound. Do not lay on more than the leather will absorb.

HARNESS MAKERS' BLACK WAX.—2lb. of Stockholm pitch, 2lb. resin, ¼-pint seal oil. In summer add more resin and less oil. Put the ingredients into an iron vessel, and melt over a slow fire. When thoroughly melted and incorporated, pour into a pail of cold water, and work the wax well until it swims, then cut into balls.

HARNESS MAKERS' JET.—8oz. gelatine, 6oz. gum arabic, 1½ pints water. Dissolve these together in an oven, then add 12oz. treacle and 10oz. ivory black. Stir occasionally, and, when cold, bottle off. Apply with a sponge. This will not resist water.

HARNESS POLISH.—4oz. glue, 1½ pints vinegar, 2oz. gum-arabic, ½-pint black ink, 2 drachms isinglass. Break the glue into small

parts, put in a basin, pour over it about 1 pint vinegar, and let it stand until soft. Put the gum in another vessel with the ink till dissolved. Melt the isinglass in as much water as will cover it. To mix them, pour the remaining vinegar, with softened glue, into a saucepan, stand on a gentle fire, stir till perfectly dissolved—see it does not burn at bottom, and not reach boiling point, about 180 degrees Fahr. Next add the gum, heat again, and add isinglass. Apply with a sponge.

INFLEXIBLE BLACK JAPAN FOR LEATHER. — Dissolve 16oz. shellac in $3\frac{1}{4}$ pints wood naphtha, and add sufficient lamp black to colour.

LEATHER DRESSING.—A fine, brilliant, elastic dressing for leather can be made as follows:—To 3lbs. of boiling water, add, with continual stirring, $\frac{1}{2}$ lb. white wax, 1oz. transparent glue, 2oz. gum senegal, $1\frac{1}{2}$ oz. white soap, and 2oz. brown candy. Finally add $2\frac{1}{2}$ oz. alcohol, and after the whole is cooled, 3oz. fine Frankfort black. The dressing is thinly applied to the leather with a soft brush; and, after it is dried, it is rubbed with a piece of fine pumice, and polished with a stiff brush.

LIQUID RENOVATOR FOR PATENT LEATHER.—Paraffin oil 48 parts, oil of lavender 1 part, essence of citronelle 1 part, spirits of ammonia 2 parts. Method of preparation:—Mix all together, and shake the bottle before using, laying on a coating with a sponge, and polishing with a soft cloth or leather afterwards.

PATENT LEATHER POLISH.—The following recipe is given by a German journal as being a good patent leather polish:—Take 60 parts whale soap and 500 parts water. Let this soak over-night. Also 60 parts glue, 500 parts water. Let this soak over-night. Boil these each separately, adding the first to the second. When thoroughly boiled add 15 parts wax, 10 parts lamp black, and boil again. Apply very sparingly to the leather.

THE CLEANSING OF MACHINE BANDS.—To cleanse a machine band, it should first be scrubbed with a brush and warm water and soap, and then, while it is still wet, a solution of ammonia should be rubbed in, which will saponify the grease in the band. Immediately after this, the band must be well rinsed in tepid water, and then stretched out to dry. Before, however, it is quite dry, smear the inner surface—and slightly also the outer surface—with the following preserving solution, viz.: 1 kilogramme of india-rubber heated to 50 degrees, mixed with the same quantity of rectified oil of turpentine. When this is completely dissolved, 780 grammes of colophonium is added, and after that 750 grammes of yellow wax. When this is well mixed, 3 kilogrammes of train oil, to which $1\frac{1}{4}$ grammes of melted tallow has been added, are poured in, stirring briskly all the while. When the band is in use its inner surface only should be smeared, the outer surface not being done after the first time. By this means, the tannin squeezed out of the band is replaced, slipping is prevented, and the band remains elastic. One kilogramme equals 2lbs. $3\frac{1}{4}$ ozs.; 1oz. equals 28 grammes.

DYEING LEATHER.—The introduction of aniline dyes has brought about a simple and effective means by which articles in small quantities may be dyed without the necessity for providing the extensive plant required when the work is carried out by the old wood dye process. As harness makers frequently require a piece of leather of a particular shade, or have in hand some article which may be brought more to the taste of the purchaser if suitably coloured to his fancy, a few recipes, with instructions for preparing the leather, are given with a view to assisting the novice in bringing about the desired change of colour. The surface of the skin must first be well washed with warm water, the advantage of which is that the dye does not penetrate so quickly, and may thus be spread more evenly over the surface. A mordaunting fluid is next applied; this differs according to the colour of the dye to be used. For all light shades, the mordaunt consists of 1 part phosphate of soda dissolved in 100 parts of water. For various shades of browns, a very small quantity of tartaric acid is added to the above, the proportion being $\frac{1}{2}$ oz. of tartaric acid to 20 gallons of the mordaunt solution. For all blue and green colours, the following mordaunt is recommended:—10 gallons water, 1lb. phosphate of soda, 1lb. dextrine, $\frac{1}{2}$ oz. tartaric acid. It is much better to commence with weak dye solutions, when aniline colours are used. See that no cracks, scratches, cuts, musty grain, or other imperfections are on the grain side. The least scratch or blemish is sure to be more conspicuous when finished than when in previous state, and it is impossible to obtain evenness of shade when the grain is musty or bruised, because the damaged places are sure to absorb the dye more readily than where the grain is perfect. A good plan for testing the colour, is to first apply it to a piece of scrap leather, and allow it to dry. All aniline dyes dry a lighter shade than when wet. To increase the depth of colour, give two or three coatings, draining the skin well before each additional coat is given. The method of preparing the dye is simple. It is only necessary to dissolve aniline in hot water at the rate of about 240 grains (half an ounce) to 10 quarts of water. The dyes, after being dissolved, must be strained through a linen cloth. They are applied with a brush, which is dipped in flat, and the dye distributed as evenly as possible. A very nice light tan colour is prepared from Phosphine No. 1., while Phosphine No. 2 gives a somewhat darker shade, and Phosphine No. 3 a dark brown.

WATER.

Bright Straw Colour.—1 Napthalin Yellow to	400	parts.
Golden Yellow.—1 Methanil Yellow to	...	100 ,,
Violet.—1 Methyl Violet to	...	100 ,,
Light Green.—1 Victoria Green to	...	200 ,,
Dark Green.—1 Extra Brilliant Green to	...	100 ,,
Sky Blue.—1 Water Blue D.N. to...	...	200 ,,
Imperial Blue.—1 Water Blue D.N. to	...	100 ,,
Buff { 4 N. } to	400	,,
1 Ersine }		
Reddish Brown.—1 Seal Brown to	...	100 ,,

METALLIC POLISHING POWDER.—Well dry on a plate or piece of paper 15oz. carb. magnesia, 15oz. precipitated chalk (carb. lime), and 25oz. ferric oxide (red ox. iron). Then mix all these powders together, and sift several times through fine mesh sieve. Put up in air-tight boxes.

METAL POLISHING PASTE FOR PLATED HARNESS.—2lb. precipitated chalk, 6oz. spirits turps, 3oz. spirits of wine, 1½oz. spirits camphor, and ¾oz. liq. ammonia. Mix the fluids together, and then gradually stir in the chalk. The metal should be covered with this compo by means of a sponge, and, when dried, polished off with a chamois leather.

POLISHING PASTE FOR BRASS.—Mix 3oz. oxalic acid in 1 quart of hot water, then mix by stirring in 100oz. powdered pumice stone, 2oz. oil of turps, 12oz. soft soap, and 12oz. olive or rape oil.

POLISHING PASTE FOR METAL.—No. 1 : 2oz. liq. cocoa-nut oil, and stir into it 2oz. Tripoli powder, 1oz. alum, 1oz. tartaric acid, and 1oz. white lead. No. 2 : 4oz. cocoa-nut oil, 2oz. lye of 30 or 40° strength, 5oz. colcothar, 5oz. water, and 1oz. spirits of sal-ammoniac. Make a soap of the oil and lye, by stirring the oil with the lye. Having separately stirred up the col. red ox. of iron in the water, mix with the soap, and add spirits of sal-ammoniac.

POLISHING PASTE FOR SILVER PLATE.—Mix 3oz. turps with 8oz. water, and boil in this mixture, until dissolved, 1lb. of hard, curd soap, and then stir in 6oz. liq. ammonia.

TO REMOVE SPOTS FROM LEATHER.—To take grease out of leather, apply white of egg to the spots, and dry in the sun. Repeat till spots are gone.

TO RESTORE PATENT LEATHER.—One pint raw linseed oil, 4ozs. cider vinegar, 2oz. spirits of wine, 1oz. butter of antimony, ½oz. spirits of hartshorn, and ½oz. oil of lavender. Shake them well together and they are ready for use. Apply with soft brush, and polish with cotton pad until dry.

EMBROCATION.—Ingredients : 1 gallon white wine vinegar, ½ gallon oil of turpentine, 20 eggs (new laid), and ½-pint liquid ammonia. The eggs are first broken into a large jar or dish, and well beaten with a whisk until thoroughly assimilated. Procure the best white wine vinegar, and place in a large vessel over the fire, carefully watching that it does not boil. The turpentine is put into another vessel, and heated to about 180 deg. Fahr. The eggs, having been suitably prepared, pour on to them the hot turpentine—constant stirring taking place—and, afterwards, the heated vinegar. A continued motion must be given to the mixture for at least three hours to ensure proper blending of the ingredients. Getting the right heat to the various ingredients, when the mixing takes place, and keeping up an uninterrupted movement to the admixture, will ensure perfect union of the parts, and give an emulsion free from any kind of sediment or floating liquid when bottled off, and allowed to stand for a time.

STENCIL INK.—A good ink for stencil purposes may be made by mixing the following :—4ozs. whiting, 4ozs. ground gum-arabic, 4oz. ultramarine blue, 2oz. of warm water. The cost is trifling.

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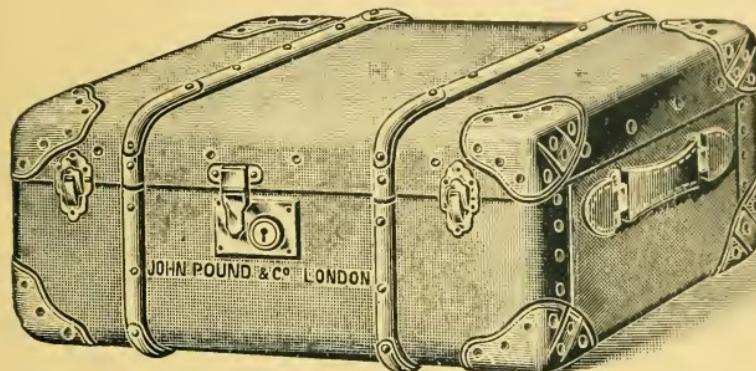
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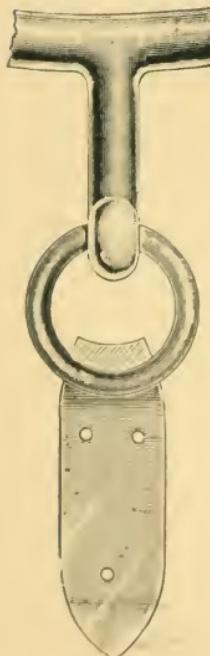
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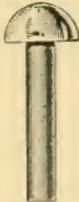
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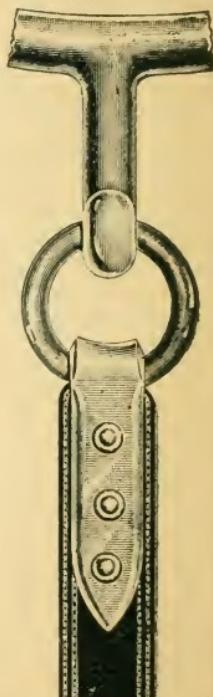
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Screw.



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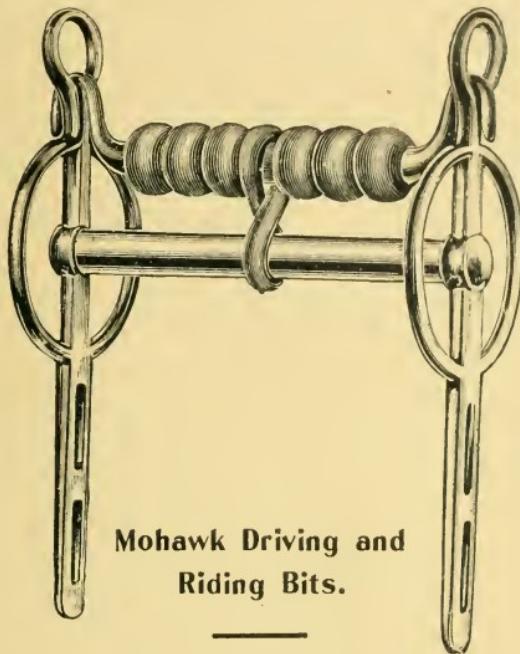
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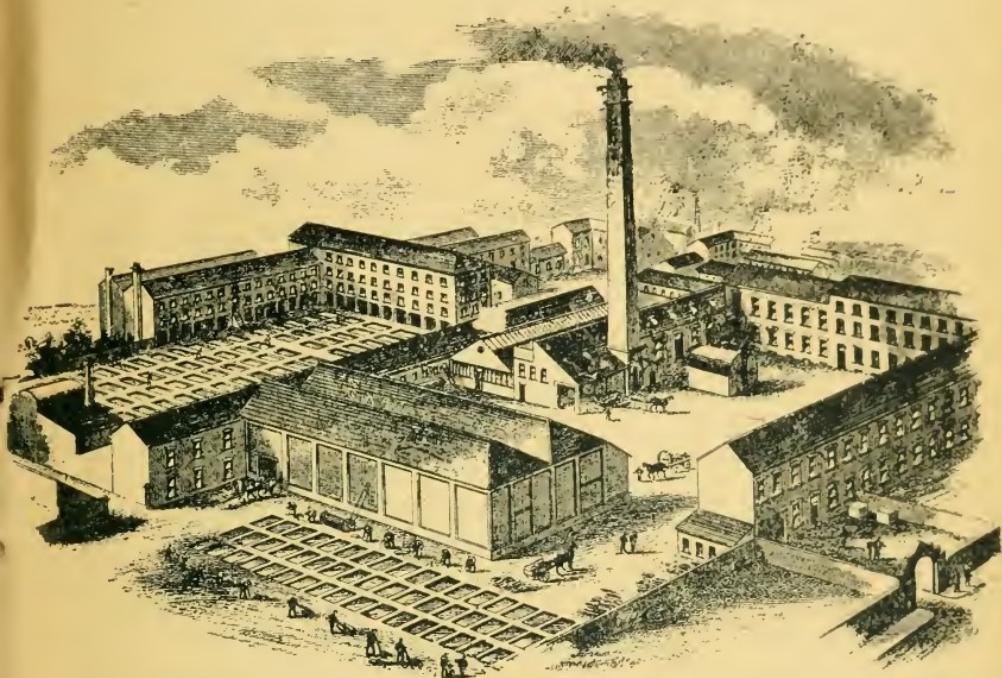
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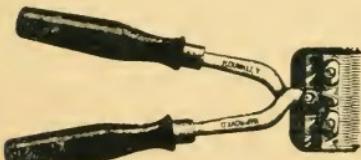
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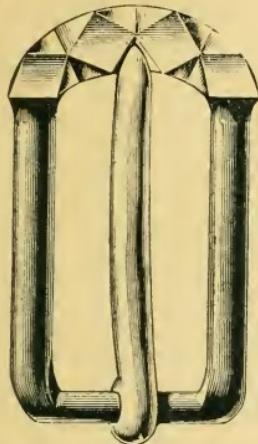


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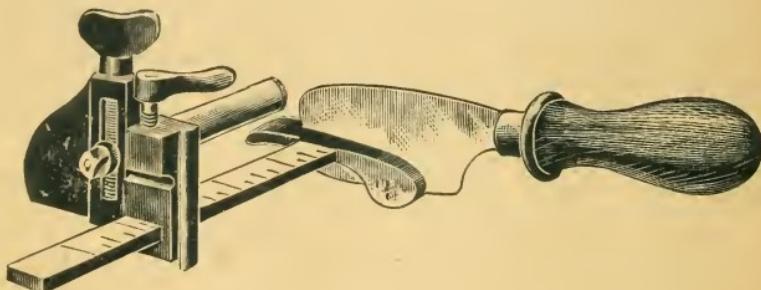
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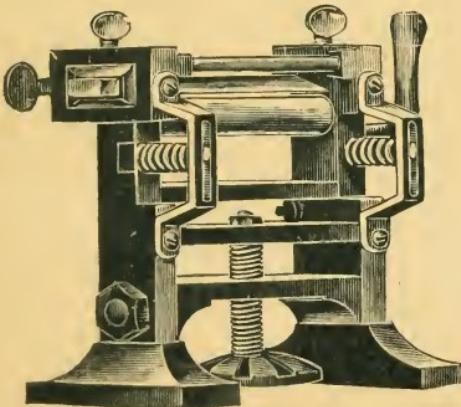
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